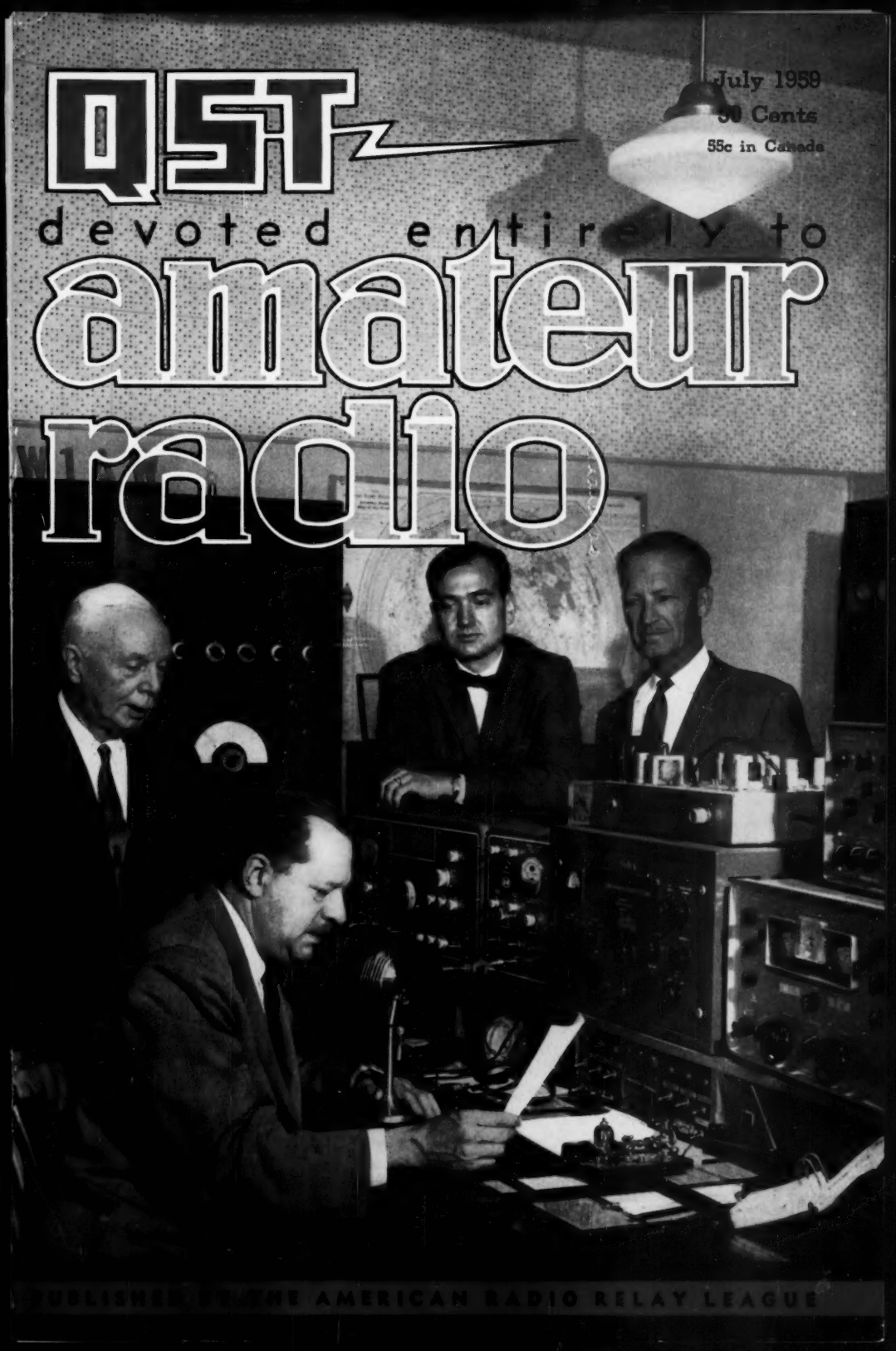
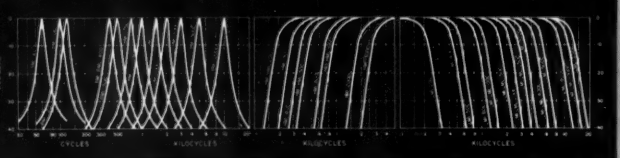

QST
July 1959
50 Cents
55c in Canada
devoted entirely to
amateur
radio
PUBLISHED BY THE AMERICAN RADIO RELAY LEAGUE

FILTERS FOR ALL APPLICATIONS FROM STOCK

HERMETICALLY SEALED TO MIL-T-27A & MIL-F-18327

UTC INTERSTAGE AND LINE FILTERS



This standardized group of filters covers most popular filter applications and frequencies. Units are in compact, drawn, magnetic shielding cases . . . 1¾₆ x 1¹¹⁄₁₆ base, 1⅜ high for BMI, LMI, BML; others 2½ high. There are six basic types:

BMI band pass units are 10K input, output to grid, 2:1 gain. Attenuation is approximately 2 db at 3% from center frequency, then 40 db per octave.

HMI high pass units are 10K in and out. Attenuation is less than 6 db at cut-off frequency and 35 db at .67 cut-off frequency.

LMI low pass units are 10K in and out. Attenuation is less than 6 db at cut-off frequency and 35 db at 1.5 cut-off frequency.

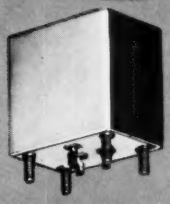
HML high pass filters are same as HMI but 500/600 ohms in and out.

LML low pass filters are same as LMI but 500/600 ohms in and out.

BML band pass units are same as BMI but 500/600 ohms input, output to grid, 9:1 gain.

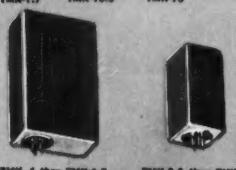
STOCK TYPES
(number in figure is cycles)

BMI-60	BMI-10000	LMI-600	HML-300
BMI-100	HMI-200	LMI-1000	HML-500
BMI-120	HMI-400	LMI-1500	HML-1000
BMI-400	HMI-500	LMI-2000	LML-1000
BMI-500	HMI-600	LMI-2500	LML-1500
BMI-750	HMI-1000	LMI-3000	LML-2000
BMI-1000	HMI-2000	LMI-4000	LML-2500
BMI-1500	HMI-3000	LMI-5000	LML-4000
BMI-2000	LMI-200	LMI-10000	LML-5000
BMI-3000	LMI-400	BML-400	LML-10000
BMI-4000	LMI-500	BML-1000	LML-12000
BMI-5000		HML-200	



STOCK TYPES
(number in figure is KC)

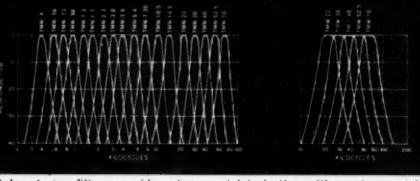
TMN-.4	TMN-2.3	TMN-14.5	TMW-22
TMN-.58	TMN-2.6	TMN-22	TMW-30
TMN-.73	TMN-2.9	TMN-30	TMW-40
TMN-.86	TMN-3.4	TMN-40	TMW-52.5
TMN-1.3	TMN-7.35	TMN-52.5	TMW-70
TMN-1.7	TMN-10.5	TMN-70	



TMN-.4 thru TMN-1.7
¹⁵⁄₁₆ x 1⅝ x 2 inches
Weight ..... 3.5 oz.

TMN-2.3 thru TMN-70
⅝ x ⅝ x 1⅛ inches
Weight ..... 1.2 oz.

UTC TELEMETERING BAND PASS FILTERS

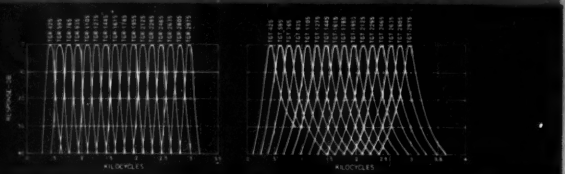


UTC standard telemetering filters provide extreme miniaturization with maximum stability, a complete set of 18 filters taking 19 cubic inches. They are 100K in and out and have an insertion loss of less than 6 db, 4 pin header for small Winchester socket.

TMN units are within 3 db at ± 7.5% of center frequency . . . down more than 18 db at ± 25% . . . more than 40 db beyond 1.75 and .58 center frequency.

TMW are within 3 db at ± 15% of center frequency . . . down more than 20 db at ± 50% . . . more than 40 db beyond 2.5 and .4 center frequency.

UTC TELEGRAPH TONE CHANNEL FILTERS



These band pass filters for multiplex transmitting and receiving provide maximum stability in miniature sizes. Both receiving and transmitting types are 600 ohms in and out, and employ 7 terminal header for sub-miniature 7 pin socket.

TGR receiving filters are within 3 db at ± 42.5 cycles from center frequency . . . down more than 30 db at ± 170 cycles . . . down more than 15 db at adjacent channel cross-over.

TGT transmitting filters are within 3 db at ± 42.5 cycles from center frequency . . . down more than 16 db at ± 170 cycles . . . down more than 7.5 db at adjacent channel cross-over.

STOCK TYPES
(number in figure is cycles)

RECEIVING

TGR-425	TGR-1785
TGR-595	TGR-1955
TGR-765	TGR-2125
TGR-935	TGR-2295
TGR-1105	TGR-2465
TGR-1275	TGR-2635
TGR-1445	TGR-2805
TGR-1615	TGR-2975

TRANSMITTING

TGT-425	TGT-1785
TGT-595	TGT-1955
TGT-765	TGT-2125
TGT-935	TGT-2295
TGT-1105	TGT-2465
TGT-1275	TGT-2635
TGT-1445	TGT-2805
TGT-1615	TGT-2975

TGT CASE
1⅛ x 1½ x 2¼ in. 8 oz.
TGR CASE
1¾ x 2¼ x 4¼ in. 19 oz.

And Special Units to Your Specifications

UNITED TRANSFORMER CORPORATION
150 Varick Street, New York 13, N. Y.
PACIFIC MFG. DIVISION: 4008 W. JEFFERSON BLVD., LOS ANGELES 16, CALIF.
EXPORT DIVISION: 13 EAST 40th STREET, NEW YORK 16, N. Y. CABLES: "ARLAB"

One Thing is *Crystal Clear*–Your Signal

HT-32A
transmitter

Exclusive HT-32A High Frequency Crystal Filter System a major, proven advance... cuts unwanted sideband at least 50 db.

Now proven superior—vastly superior to any other type filter—is Hallicrafters' exclusive 5.0 mc. quartz crystal filter system.

Result of a three-year research program, the system makes possible, for the first time, *high frequency filtering.* Result; unprecedented rejection of unwanted sideband—50 db. or more—and the *cleanest signal of all,* bar none.

This and another major technical advance—Hallicrafters' exclusive Bridged-Tee Modulator—make the HT-32A the most wanted SSB transmitter in history.

Certified for F.C.D.A. Matching Funds.

Export Sales: International Division
Raytheon Manufacturing Company
Waltham, Massachusetts

Compare these features

- **5.0 mc. quartz crystal filter cuts unwanted sideband 50 db. or more.**
- **Bridged-Tee modulator; temperature stabilized and compensated.**
- **SSB, AM or CW output on 80, 40, 20, 15, 10 meter bands.**
- **High stability, gear driven V.F.O.**
- **144 watts peak power input.**
- **3rd and 5th order distortion products down 30 db. or more.**
- **Keying circuit for RTTY.**
- **PTT.**
- **VOX.**

Proof of the HT-32A's superiority is heard on ham bands night after night. Listen. You won't be satisfied with anything but the cleanest signal on the air.

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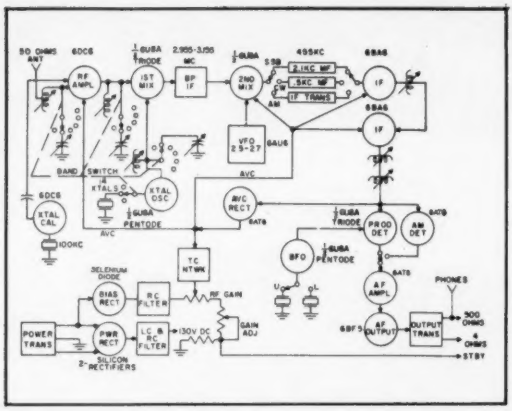
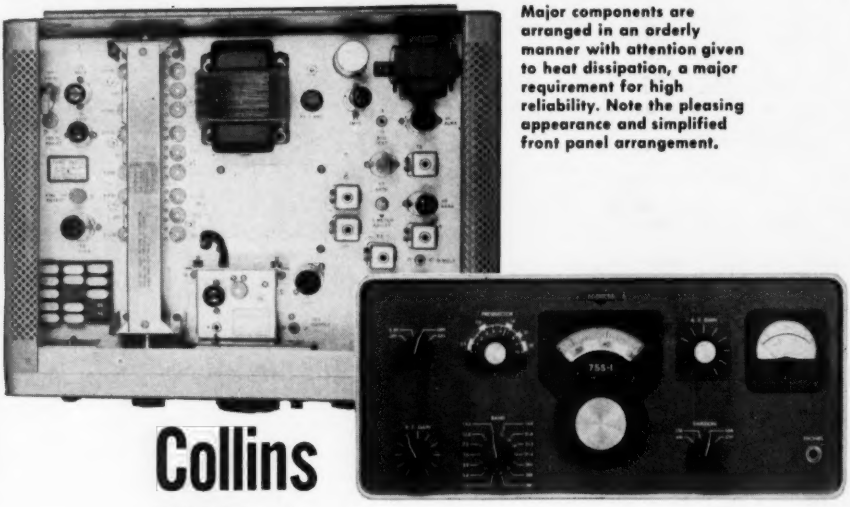
In our 25th year of service



Circuits include new design low noise mixers for improved S/N ratio, HF crystal oscillator and low frequency VFO for maximum frequency stability, and Mechanical Filters for optimum selectivity.



Major components are arranged in an orderly manner with attention given to heat dissipation, a major requirement for high reliability. Note the pleasing appearance and simplified front panel arrangement.

Collins 75S-1 Receiver

Surpassing in Performance . . . Simplified in Operation

New criteria of performance, compactness and operational simplicity have been achieved in the new Collins S/Line Receiver — the 75S-1. The highly accurate linear dial, coupled with extremely stable circuits, provides maximum ease in tuning in the frequency you want for keeping a sked or checking into a net. A bonus feature of the S/Line enables the 75S-1 to control the frequency of its companion 32S-1 Transmitter, putting the transmitter right on the received signal frequency without zero beating.

Other new highlights of the 75S-1 design include AVC with a very flat characteristic for optimum SSB performance; 150 volts on vacuum tube plates for reduced heat dissipation and increased reliability; silicon power rectifiers; control of three degrees of selectivity — 2.1 or optional 0.5 kc with Mechanical Filters, or 4.0 kc conventional IF transformers for AM.

Time-proven features of its Collins predecessors incorporated in the new receiver include dual conversion with a crystal controlled first injection oscillator; bandpass first IF; RF amplifier with low cross modulation products; stable, permeability-tuned VFO, product detector for SSB, and diode detector for AM.

The 75S-1 offers reception of SSB, CW or AM signals on all amateur bands between 3.5 and 29.7 mc, with coverage of any frequency in the 3.5 to 30 mc range, except 5.0 to 6.5 mc, possible by substituting crystals.

See the 75S-1 and other units of the S/Line — 32S-1 Transmitter, 30S-1 1 kw (Average Plate Input) Linear Amplifier and accessories — on display by your Collins distributor.

COLLINS

QST

JULY 1959

VOLUME XLIII • NUMBER 7

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OFFICES

38 La Salle Road
West Hartford 7, Connecticut
TEL.: ADams 6-2535

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Applied Science and Technology Index

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—CONTENTS—

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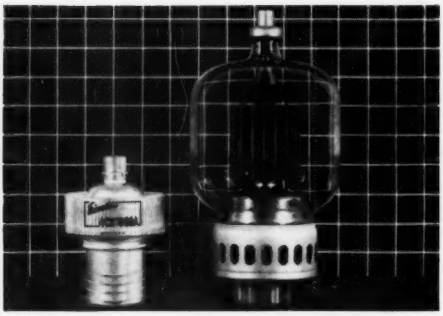
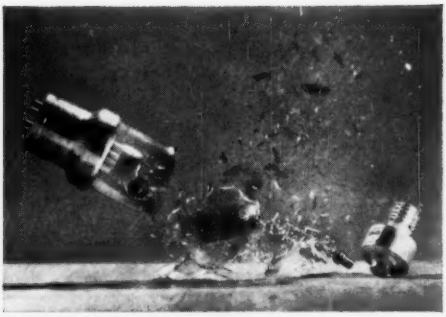
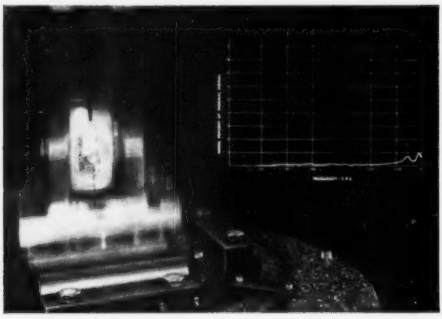
in more than 40 tube types



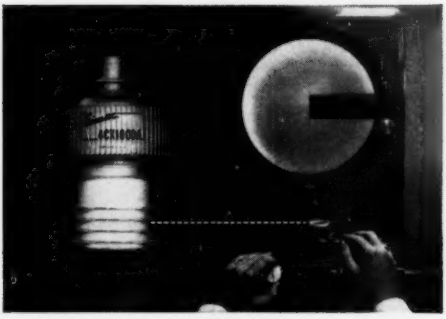
SMALLER SIZE



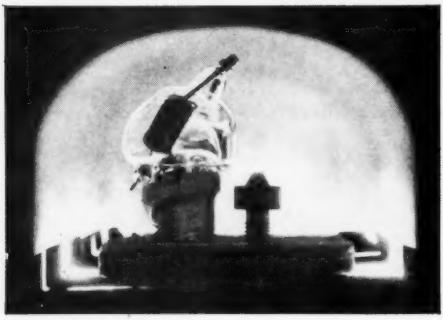
IMPACT SURVIVAL



VIBRATION SURVIVAL



EXACT DIMENSIONAL UNIFORMITY



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Eimac First with ceramic tubes that can take it

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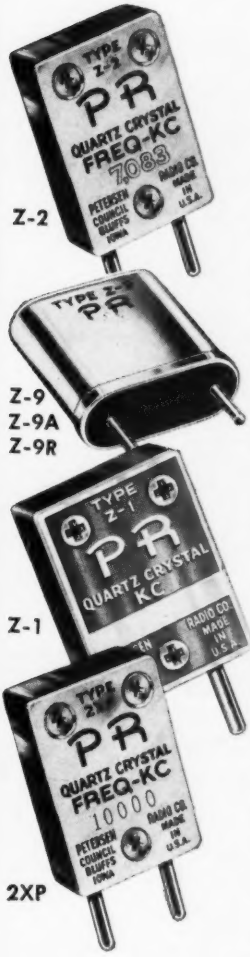
It pays to insist on PR *crystals*

STANDARD OF EXCELLENCE SINCE 1934



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40, 80 and 160 Meters, PR Type Z-2

Rugged. Low drift, fundamental oscillators. High activity and power output. Stands up under maximum crystal currents. Stable, long-lasting, hermetically sealed; ±500 cycles..... **$2.95** Net

24 to 27 Mc., PR Type Z-9A

Third overtone; multiplies into either 2-meter or 6-meter band; hermetically sealed; calibrated 24 to 27 Mc., ±3 Kc.; .050" pins. **$4.95** Net

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Fifth overtone; for operating directly in 6-meter band; hermetically sealed; calibrated 50 to 54 Mc., ±15 Kc.; .050" pins. **$6.95** Net

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3023.5 Kc., .005% ..... **$3.45** Net

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Official assigned frequencies in the range. Calibrated to .005%. 1600 to 10000 Kc..... **$3.45** Net

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For Lear, Narco and similar equipment operating in the 121 Mc. region, requiring crystals in 30 Mc. range. Each..... **$4.95** Net

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To determine band edge. To keep the VFO and receiver properly calibrated.

100 Kc. ... **$6.95** Net

Z-6A

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Section Communications Managers of the ARRL Communications Department

Reports Invited. All amateurs, especially League members, are invited to report station activities on the first of each month (for preceding month) direct to the SCM, the administrative ARRL official elected by members in each Section. Radio club reports are also desired by SCMs for inclusion in *QST*. **ARRL Field Organization station appointments** are available in the areas shown to qualified League members holding Canadian or FCC amateur license, General or Conditional Class or above. These include ORS, OES, OPS, OO and OBS. SCMs also desire applications for SEC, EC, RM and PAM where vacancies exist. OES appointment is available to Novices and Technicians.

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West Indies (Cuba-P.R.-V.I.)	KP4DJ	William Werner	563 Ramon Llovet	Urb. Truman Rio Piedras, P. R.
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British Columbia	VE7JT	Peter M. McIntyre	981 West 26th Ave.	Vancouver, B. C
Yukon				
Manitoba	VE4IF	James A. Elliott	190 Oakdean Blvd.	St. James, Winnipeg 12
Saskatchewan	VE5LU	Lionel O'Byrne		Rowatt

*Official appointed to act temporarily in the absence of a regular official.

THE AMERICAN RADIO RELAY LEAGUE, INC.,

is a noncommercial association of radio amateurs, bonded for the promotion of interest in amateur radio communication and experimentation, for the relaying of messages by radio, for the advancement of the radio art and of the public welfare, for the representation of the radio amateur in legislative matters, and for the maintenance of fraternalism and a high standard of conduct.

It is an incorporated association without capital stock, chartered under the laws of Connecticut. Its affairs are governed by a Board of Directors, elected every two years by the general membership. The officers are elected or appointed by the Directors. The League is noncommercial and no one commercially engaged in the manufacture, sale or rental of radio apparatus is eligible to membership on its board.

"Of, by and for the amateur," it numbers within its ranks practically every worth-while amateur in the nation and has a history of glorious achievement as the standard-bearer in amateur affairs.

Inquiries regarding membership are solicited. A bona fide interest in amateur radio is the only essential qualification; ownership of a transmitting station and knowledge of the code are not prerequisite, although full voting membership is granted only to licensed amateurs.

All general correspondence should be addressed to the administrative headquarters at West Hartford, Connecticut.

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1175 Longhill Way, Monterey Park, Calif.

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GRADY A. PAYNE W5ETA
5103 Linden St., Bellaire, Texas
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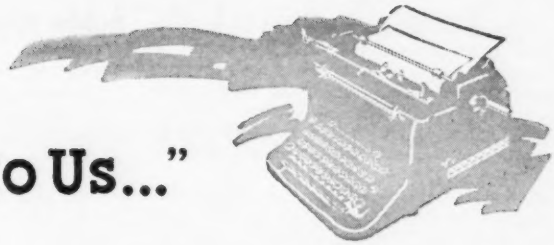
4339 S. Peoria, Tulsa 5, Okla.



"It Seems to Us..."

MEMBERSHIP DUES

The Board of Directors has established, effective August 1, new rates of dues for membership in the American Radio Relay League — $5 in the U. S. and possessions, $5.25 in Canada. (The foreign rate had earlier been increased to $6.)

The former rate was set by the Board in May, 1948 — more than eleven years ago. It will be apparent, we trust, that in those intervening years the costs of operating a membership association such as the League have risen much the same as in every other phase of American economic life. The costs of printing are up, and so are those of postage, travel, salaries, office supplies and operations, telephone and telegraph, taxes, and so on and on. A rise in dues has been avoided until now by the use of alternative means of increasing League revenue — for examples, a higher price for the *Handbook* and some other ARRL publications, and several increases in advertising rates; but these figures are now just about at the point where they are all the traffic will bear.

Longer-term members of the League will, we feel sure, readily understand the need for a rise in membership dues. Time and again at club meetings we have attended in the past few years, members have volunteered their views of surprise that a dues rise had not already been found necessary. But particularly as background for newer amateurs we'd like to point out that while the receipt of *QST* is the most tangible result of membership in ARRL, there are a multitude of services provided from League finances that are perhaps too often taken for granted.

Possibly most important is representation of the amateur radio service before the Federal Communications Commission concerning our domestic amateur regulations, and participation in world telecommunications conferences — such as that opening in Geneva, Switzerland, in August this year — where our very existence is at stake. As an example, for nearly three years now the League has represented the amateur service at periodic meetings in Washington held to formulate an official U. S. viewpoint toward future world regulations (which, we may say once again, is now established as seeking to provide continuance of every frequency privilege we now have in this country). The General Counsel of the League furnishes advice and guidance to amateurs, or their attorneys, in instances of local or state regulatory actions which may adversely affect the amateur service; and when the case deals with basic principles of amateur rights, may formally enter the proceeding to protect amateur interests.

The phase of League activity which perhaps is the closest — aside from *QST* — to the individual member comes under our Communications Department. There are operating events such as the DX competition, Field Day and the Sweepstakes, plus other more specialized contests and parties; mere sponsorship is simple, but careful administration is a time-consuming and expensive task. The League's extensive field organization, from elected SCMs to the newest CD appointment of OES, and its associated projects of the National Traffic System and emergency preparedness (including RACES promotion and liaison), are major functions in continuing to write a favorable record of amateur radio operation in the public interest. A helpful assortment of Training Aids is made available to affiliated clubs for meeting programs. The Maxim Memorial Station, W1AW, has conducted code-practice sessions almost nightly for nearly twenty years, assisting thousands of persons to enter the field of amateur radio, and more thousands of hams to increase their code abilities. Twice-nightly bulletins from W1AW keep listeners up-to-date on late developments, such as regulatory changes. Lithographed publications go regularly to affiliated clubs and thousands of Communications Department appointees to assist them in their organizational work.

The Headquarters provides assistance to individual members in many specialized problems — for example, technical information, answers to questions on licensing and regulatory matters, and public-relations material for individual and club use. To illustrate with just one figure, the League expended over $25,000 during 1958 solely in *postage* for membership correspondence and the mailing of bulletins.

From League finances come also the costs of operating the democratic system by which we members govern the overall policy of the League — expenses of directors in traveling

(Continued on next page)

to conventions, hamfests and club meetings to gather amateur opinion so that they might be adequately prepared to represent their division memberships; and expenses of the Board meeting itself, in which the views of each division are brought into focus and decisions made, according to majority sentiment, to chart the future course of the League.

True, some of these League services are not things you can see and feel, like *QST*, but they're vitally important. And they cost money. League expenditures during 1958 strictly for such membership services were something over $200,000 — more than $2 per member on wholly organizational matters, entirely separate from *QST* or other publications activities.

The members of the League are, in the final analysis, its owners — in one sense, "stockholders." But, unlike stockholders, members do not expect to receive dividend checks. The dividends which you, as an ARRL member, receive from the operations of the League are in the form of the multitude of services such as those we have mentioned — an unceasing effort to protect the interests of our hobby and improve the status of amateur radio in all its many aspects.

At its 1959 meeting, the Board of Directors found that with rising costs of all goods and services, eventually some of these membership benefits would have to be curtailed or discontinued. The Board had two alternatives: It could leave dues at $4 and risk curtailment of services, or it could raise the dues so that they would continue. The Board felt these activities were vital to amateur radio's future and therefore decided to continue them by raising membership dues. QST

COMING A.R.R.L. CONVENTIONS

July 4–5 — Pacific Division, San Jose, Calif.
July 11–12 — North Dakota State, Dickinson, North Dakota
July 24–26 — Southwestern Division, Pasadena, California
August 15–16 — Pacific Div., Honolulu
August 22–23 — Central-Midwest Divisions, St. Louis, Mo.
September 5–6 — N. E. Division, Hartford
Sept. 5–7 — Maritime Province, Halifax, Nova Scotia
October 3–4 — Roanoke Division, Richmond, Va.
Oct. 17–18 — Ontario Province, London, Ontario

(See page 58)

NORTH DAKOTA STATE CONVENTION
July 11–12

The T. R. (Teddy Roosevelt) Amateur Radio Club of Dickinson will be host at the North Dakota State Convention and Hamfest to be held at the Theodore Roosevelt National Memorial Park, Medora, North Dakota on July 11 and 12. The western theme of the convention will be highlighted by tours through the badlands and Chateau De Mores. Those attending will have a chance to see the famed outdoor drama "Old Four Eyes." Outstanding speakers are planned. Pre-registration is $5.00. For further information, contact Quain Jahrman, KØMEF, Box 1101, Dickinson, North Dakota.

SOUTHWESTERN DIVISION CONVENTION
Pasadena, California—July 24–26

A Sunday afternoon banquet will highlight the 1959 Southwestern Division ARRL Convention, July 24–26, at the Huntington-Sheraton Hotel, Pasadena, Calif., with Dr. Henry Richter, W6VZA, as General Chairman.

The three-day affair is sponsored by the San Gabriel Valley Radio Club and the Ramona Radio Club. Advance registration, at $7.50 per person, may be made through Ralph Tronske, W6IDF, P.O. Box 45, San Gabriel, Calif. Preregistration closes July 17.

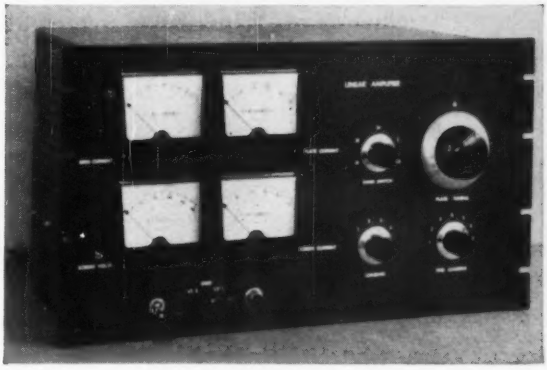
The Sunday, July 26, banquet at 1 P.M. will be at the Pasadena Civic Auditorium. Special activities include technical sessions, contests, events for YL-XYLs, and a Wouff-Hong Initiation.

To help publicize the event, the San Gabriel Club also announces that it is sponsoring a QSO Party on Sunday, July 12, from 0800 to 1200 PDST, on 10 through 80 meters. The entire club membership will participate and anyone who contacts ten SGVRC members will be entitled to receive the SGVRC Satellite Tracking Station Certificate. The SGVRC member with the greatest number of contacts will receive a 24-hour clock. The mail address of the SGVRC is P.O. Box 45, San Gabriel, Calif.

OUR COVER

One of the traditional activities at Board-meeting time each May is a visit to the Headquarters station W1AW by the officers and directors. After the customary inspection of the facilities, directors and Hq. staff members gather in the basement for coffee-and-donuts, and movies or talks on ham radio or some related activity. This month's cover shows President Dosland (WØTSN), at the W1AW mike, while Director Reid (VE2BE), Director Maer (WØIC), and Vice-President Groves (W5NW) look on. The equipment shown is only a part of that used at W1AW. Additional pieces of gear are in other corners of the room and at an operating position in the basement, and the gear at the main desk is shifted around fairly frequently.

An 800-Watt P.E.P. Input Linear



A clean-looking 800-watt linear amplifier. The band switch and pi-network controls are at the right. Shielding enclosure is of perforated aluminum. The panel is a standard 10½-inch rack unit.

7094s in Parallel

BY EDWARD B. NOEL,* W8GRY

Because of its low driving-voltage requirements, the 7094 lends itself well to resistive broad-band input circuits. As a result, good stability can be obtained with circuit simplicity.

HERE is an 800-watt linear amplifier that takes advantage of the high power sensitivity of the new RCA 7094 beam power tubes. It is about as simple as a two-tube high-power amplifier can be, since there is no tuned input circuit, and no neutralization. It is stable and free of parasitics on all bands from 80 to 10 meters.

The circuit diagram, Fig. 1, shows an input circuit consisting of a 50-ohm 50-watt Globar resistor. A noninductive resistor with a rating of less than 50 watts can be used because less than 40 watts peak is needed to develop the required driving voltage for full peak output, Class AB_1. With c.w. and single-sideband voice waveforms the average dissipation is very much less. If a Globar or noninductive resistor can't be located, eight or ten two-watt carbon resistors in series parallel would probably do the trick.

The 50-ohm resistive input does three important things. It matches the output impedance of many of the new s.s.b. exciters, and simplifies coupling problems; it eliminates any need for grid tuning, and so speeds up band changing; and it loads the grid circuit so heavily that the amplifier is extremely stable. This last is particularly important with tubes of high power sensitivity. Because of this low resistance and heavy loading, the usually desirable neutralization can be omitted.

A reversed 3-ampere 6.3-volt filament transformer, T_1, and voltage-doubler circuit supply 250 volts for standby cut-off bias and for operation of the VR-90 voltage-regulator tube for regulated operating bias. A small d.p.d.t. relay, K_1, seen on the corner of the chassis in the top and rear views, can be actuated by the exciter VOX relay or, as in the author's case, from extra contacts on the coax antenna relay. Energizing this relay connects each grid to its own potentiometer arm on separate 5K potentiometers R_4 and R_5. Connections are run from these potentiometer arms to terminal-block positions 1 and 2 so bias can be checked with an external voltmeter after the shielding is all in place. The screwdriver shafts of the two bias pots can be seen just above the terminal board in the rear view.

At the rear of the chassis are the two cathode jacks J_3 and J_4 which permit individual metering of the two tubes. The bias pots should be adjusted so that each tube idles at 30 ma. The individual settings in this case were −63 volts and −68 volts.

The 5-ma. grid meter can be placed in the grid circuit of either tube by means of a d.p.d.t. switch, S_3. It should be left in the grid of the tube with the lowest bias. If the needle even flicks on modulation it is a sure sign that the amplifier is being overdriven, and is out of the AB_1 operating region.

The rest of the r.f. circuit is a conventional pi network. The two variables are Johnson 250E30 (154–9) and 500E20 (154–3) with 0.075- and 0.045-inch spacings, respectively. The coil is a B&W 851 with four turns removed from the 80-meter section, and the 40-meter tap moved one turn toward the h.f. end. This gives the right Q for operation at 2000 volts and 400-ma. peak. The coarse loading switch was taken from a

* 1361 Oakridge Drive, Cleveland Heights 21, Ohio.

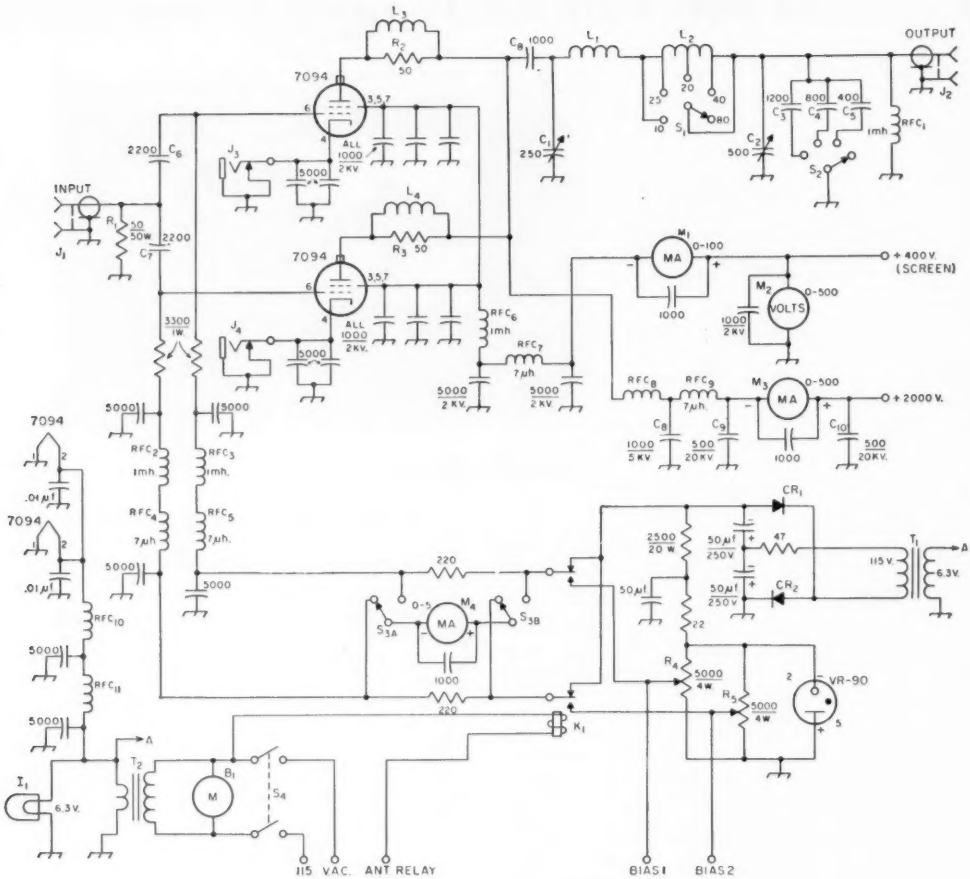


Fig. 1—Circuit of the 800-watt linear amplifier. Unless otherwise indicated, capacitances are in $\mu\mu$f. All fixed capacitors except those marked with polarity and those listed below are disk ceramic. Resistances are in ohms, and resistors are ½ watt unless indicated otherwise.

B_1—Blower, 15 c.f.m. or more (Surplus, Burstein-Applebee etc.)
C_1—250-$\mu\mu$f. 3000-volt variable (Johnson 154-9).
C_2—500-$\mu\mu$f. 2000-volt variable (Johnson 154-3).
C_3, C_4, C_5—2500-volt mica.
C_6, C_7—Mica.
C_8—5000-volt ceramic (Centralab 858S-1000).
C_9, C_{10}—20,000-volt ceramic (Centralab TV-207 or equivalent).
CR_1, CR_2—100-ma. selenium rectifier.
I_1—6.3-volt panel lamp.
J_1, J_2—Coax receptacle (SO-239).
J_3, J_4—Closed-circuit phone jack.
K_1—D.p.d.t. 115-volt a.c. relay.
L_1—4 turns ⅜ × 1/16-inch copper strip, 1⅜-inch diameter, 2½ inches long (part of B&W 851 coil unit).
L_2—4¾ turns No. 8, 2¾-inch diam., 1¾ inches long, tapped at 1¾ turns from L_1 end, plus 9½ turns No. 12, 2¾-inch diam., 1½ inches long, tapped 7 turns from output end; see text (Part of B&W 851 unit).
L_3, L_4—3 turns No. 12, ⅜-inch diam., 1 inch long.
M_1, M_2, M_3, M_4—3½-inch square meter (Simpson Model 1327).
R_1—Noninductive resistor; see text.
R_2, R_3—Three 150-ohm 1-watt carbon resistors in parallel.
R_4, R_5—5000-ohm 4-watt wire-wound potentiometer (Mallory M5MPK).
RFC_1, RFC_2, RFC_3, RFC_6—1-mh. r.f. choke (National R-50 or similar).
RFC_4, RFC_5, RFC_7, RFC_9—7-μh. v.h.f. choke (Ohmite Z-50).
RFC_8—145-μh. r.f. choke (National R-175A).
RFC_{10}, RFC_{11}—20 turns No. 14, ⅜-inch diam.
S_1—Heavy-duty band switch (part of B&W 851 unit).
S_2—4-position single-pole ceramic rotary switch (see text).
S_3—D.p.d.t. rotary switch.
S_4—D.p.s.t. toggle switch.
T_1—6.3-volt 3-amp. filament transformer (Stancor P-6466 or similar).
T_2—6.3-volt 10-amp. filament transformer (Stancor P-6308 or similar).

TU-9-B tuning unit, so there is no problem in handling the high tank currents. This pi net has worked into some awkward antenna inputs with standing-wave ratios as high as 6:1.

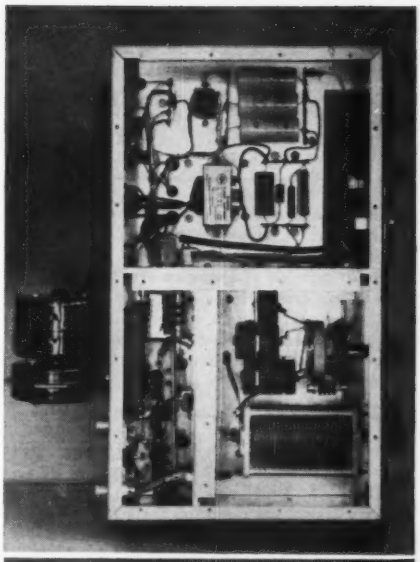
The plate choke is a National R-175A. The metal mounting bracket was removed so that the top cover would clear the top end of the choke. The blocking capacitor is a type Centralab 858. The parasitic chokes consist of three turns of No. 12, ⅜ inch in diameter and one inch long with three 150-ohm 1-watt resistors in parallel soldered across the three turns. The tube sockets are mounted ⅝ inch below the surface of the chassis, according to the manufacturer's instructions for best shielding of the input and output circuits.

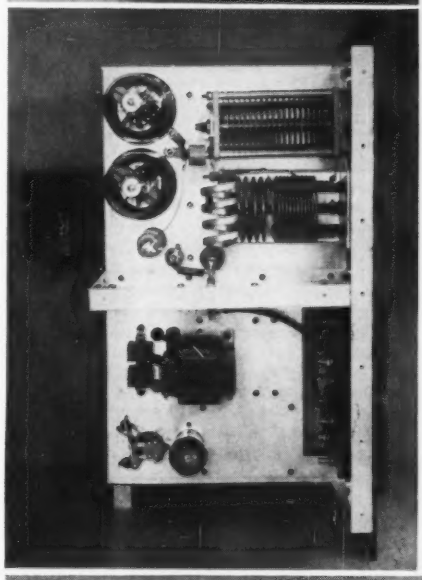
The chassis measures 3 by 12 by 17 inches and the panel is 10½ inches high. The top of the chassis is divided in half by an aluminum partition shield so that the meters and filament transformer will not be subjected to the r.f. field. The bottom of the chassis likewise has a shield across the middle. All leads passing through this shield are heavily bypassed and filtered. The "hot" half of the bottom is further divided by another shield which separates the output loading capacitor from the area of the tube socket, grid, and filament leads. All screen-grid terminals are individually bypassed with 0.001-μf. 2-kv. disk ceramics.

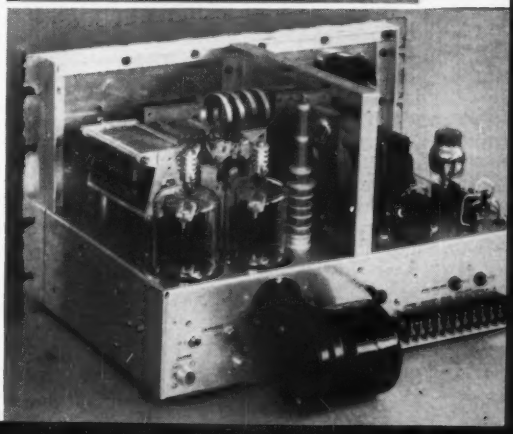
A blower at the rear of the chassis provides ventilation for the tubes. The one shown is a surplus item which the author happened to have. It is probably larger than necessary. Instead of one large hole for the blower exhaust, a series of ¼-inch holes is drilled in the edge of the chassis to provide better r.f. screening. The grid-circuit swamping resistors are located near the blower exhaust so that they will be in the air stream.

It is a bit of a luxury to have four meters, but they do dress up the appearance, and balance the panel. The 500-ma. plate meter is, of course, an absolute must. The 5-ma. grid meter is not strictly essential, but was added as an overdrive indicator. The other two meters are a 500-volt d.c. meter for the screen voltage, and a 100-ma. meter for the screen current. At W8GRY the screen supply is a voltage-regulated variable-voltage unit, so the voltmeter serves a purpose. The screen-current meter is advisable because

(*Continued on page 140*)







In the upper right photograph, the fixed and variable pi-network output capacitors are in the lower right-hand section, shielded from tube sockets and grid-circuit components to the left and bias-supply circuit above.

In the photograph in the center, 12 × 17 × 13-inch chassis provides plenty of space for the components of the 800-watt linear amplifier without crowding. Power and r.f. circuits are isolated by a partition shield. A cutout in the right-hand side of the chassis provides clearance for the meters. The transformer at the left is T_2.

The bottom photograph is a rear view of the 800-watt linear showing terminal arrangement and mounting of the blower. Aluminum angle provides support for the shielding enclosure.

Station Control Circuits

Tying the Transmitter, Receiver and Antenna Together

BY PAUL BARTON,* W6JAT

Here are some station control circuits that result in getting on and off the air "easily and quietly." They are in use in a voice-controlled kw. s.s.b. rig (sometimes operated on c.w. or a.m.). While you may not want to use the over-all circuit verbatim, some of the basic ideas might well fit into your rig.

FIGURE 1 shows a version of blocked grid keying. With all three power supplies shown turned on and switch S_1 open, the screen grid goes to cathode potential through R_1 (about 25,000 ohms), and the sum of the screen pack, plus the bias pack, is applied to the control grid as negative bias. The tube is completely cut off

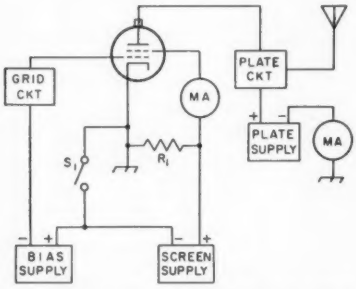


Fig. 1—In this switching circuit, opening S_1 brings the screen grid to ground potential thrcugh R_1 and raises the control grid to the sum of the bias and screen supplies.

and becomes inoperative. As the tube is drawing no current, the plate power supply sees only its bleeder resistor. The power supply must be properly designed to have good regulation with no external load, or its voltage will soar when the transmitter is in the stand-by condition.

When S_1 is closed, R_1 becomes part of the bleeder on the screen supply, and the bias and screen supplies perform their jobs independently. Proper adjustment of these two supplies sets the operating point of the amplifier. The switch S_1 has to handle only the current through R_1 plus any screen current, and it can be the voice-controlled relay contacts.

Fig. 2 is a satisfactory variation of Fig. 1 if the combined screen-bias supply is heavily bled through R_2 and R_3. About 100-ma. bleed is satisfactory. The 40-μf. capacitor is necessary to ensure a low audio impedance of the operating bias supply if grid current is drawn, and is in

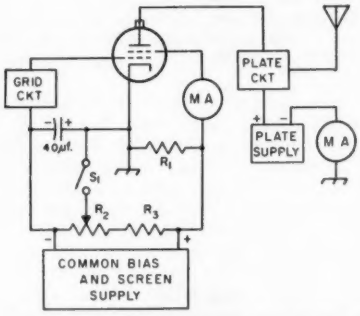


Fig. 2—The bias and screen supplies can be combined if a heavy bleed resistor (R_2 and R_3) is used. A high capacitance across R_1 might improve the linearity of the amplifier.

addition to the filter in the supply. A similar capacitor across R_1 might be a good idea but has not been tried yet.

Fig. 3 shows an electronic transmit-receive switch of the cathode-follower type using the well-known principle of a high value of grid leak to block itself off when a powerful signal (such as the station transmitter) hits it. This type of circuit has been reported by some users to generate TVI by acting as an overdriven amplifier. Putting the low-pass filter between the t.r.

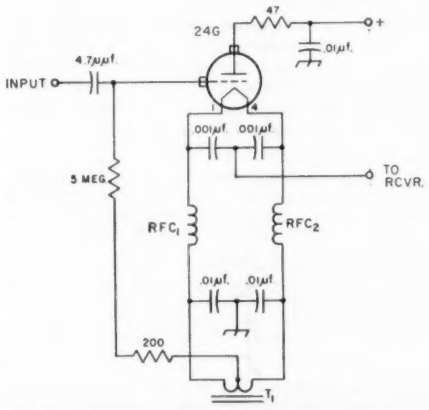


Fig. 3—A high-powered version of the cathode-follower t.r. switch.

* 14666 Berry Way, San Jose 24, Calif.

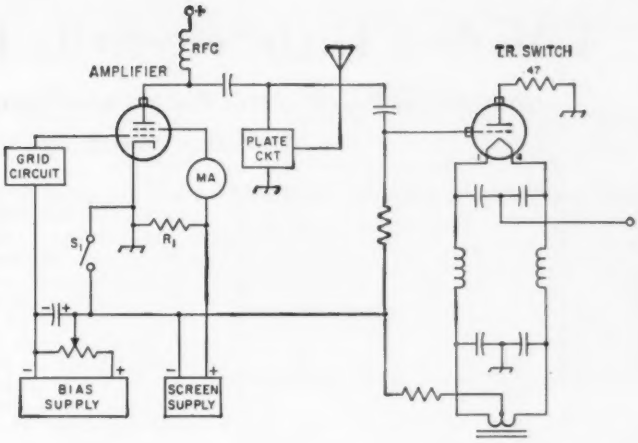


Fig. 4—Combining the t.r. switch with the amplifier switching circuit. Grounding the d.c. circuit of the t.r. switch through S_1 lets the screen supply serve as the t.r. switch supply during reception. Insulation in T_1 should exceed screen supply voltage.

switch and antenna takes care of the TVI problem, however.

Fig. 4 is the t.r. switch of Fig. 3 with the previous transmitter control. When the amplifier is on standby (S_1 open) the plate circuit of the amplifier becomes the input circuit of the t.r. switch. This steps up the impedance of the 50-ohm transmission line of the antenna to a high impedance for the grid of the t.r. cathode follower. This transformer action gives a voltage gain to the t.r. switch. At this time the blocked final amplifier is inoperative and therefore does not load the tank circuit as it would in systems where the amplifier is allowed to draw idling plate current during standby periods. Blocking the amplifier also eliminates the diode noise that would otherwise mask weak signals.

When S_1 is open, the t.r. tube gets anode voltage from the screen supply through R_1, one end of which is on ground. On transmit, this voltage is shorted out by S_1, resulting in no anode voltage for the t.r. switch.

This t.r. switch has been used as shown in Fig. 4 very satisfactorily with no damage to the receiver from a 1-kw. amplifier. However, there is a small capacitive feedthrough from the amplifier to the output of the t.r. switch. Therefore, the well-known grounded-grid type t.r. switch of Fig. 5 was also put into service, after the cathode follower switch.

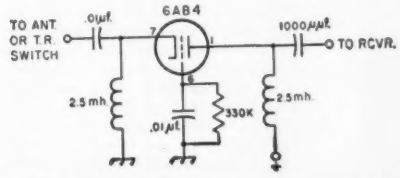


Fig. 5—Additional protection can be obtained by building this t.r. switch into the receiver. In low-power applications, it can be connected to the antenna feedline.

The 6AB4 grounded-grid t.r. switch was built directly into the receiver and uses the receiver power supply. This t.r. switch by itself has been used with low-power rigs with no damage to the receiver or TV set.

The circuit of Fig. 4 and the additional t.r. switch of Fig. 5 (built in the receiver) have been in use for some time with completely satisfactory results. The switch S_1 is not manually operated; it is a circuit on the voice-operated relay of the exciter. The back contact on this same circuit is used to turn on the receiver, via the so-called "stand-by switch" circuit of the receiver. The circuit allows getting off and on the air without the bang of relays (assuming the sensitive voice-operated relay is quiet), allows for fast breaks, and yet it completely protects the receiver. Some receivers click badly when switched to stand-by or back on. This should be corrected, as the click can cause unstable voice-controlled operation by triggering the rig via the microphone.

There is a gain of about two S-units in the 24G cathode follower. With the plate and screen voltage off, there is enough feedthrough from antenna to receiver through the 24G to receive satisfactorily by increasing the receiver gain control. You can also peak the final plate tank with or without the final being on and without excitation to the final by listening in the receiver.

The high-resistance grid leak must be a high-voltage type, or several smaller resistors in series, as it will see a peak r.f. voltage nearly equal to the plate volts of the final amplifier. This high voltage is why a tube like the 24G was selected, as its grid-to-filament breakdown voltage is very high. The 5-$\mu\mu$f. coupling capacitor to the grid of the 24G is a Jennings vacuum type X-5.

The filament chokes in the 24G were wound self-supporting, 15 turns of No. 14 enamel wire, ¾-inch diameter. The heater chokes (not shown) for the 6AB4 were wound of No. 20 enamel wire,

(*Continued on page 142*)

A Modern High-Selectivity Receiver

High-Frequency Crystal Filters and Hang A.V.C.

BY CARL VAIL,* W9MUR

This is a blow-by-blow description of only the "front end" of a receiver, but that is because the i.f. amplifier has already been described in QST. For those who don't have the earlier issue of QST, the i.f. circuit is given here.

SINCE building the first simple push-pull t.p.t.g. transmitter (two 45s) and its matching simple regenerative receiver, just about all of the equipment used at W9MUR has been home built. However, when the first homemade regenerative receiver became obsolete and the time came that a modern amateur station must have a band-switching super, I broke down and bought a factory-built receiver and have used one ever since, until a short time ago.

When I read W1DX's article, "What's Wrong With Our Present Receivers?", in the January 1957 *QST*, the principle [1] he pointed out seemed good to me, so I decided to build "the receiver" for the ham shack. The results have been very gratifying. Since I wanted to use the Hycon 2.2-Mc. crystal-filter i.f. but had no spare NC-300 around, it was necessary for me to design and build a front end.

The circuit to be described here is a band-switching converter, for the ham bands only, having an output at 2215 kc. to feed into an i.f. amplifier similar to the one described in the article referred to above. It is suggested that the reader review this article in order to get some background for the present receiver. The i.f. amplifier is also described in both the 1957 and 1958 *Radio Amateur's Handbook*.

Upon first thought, the cost of the crystal filter seemed prohibitive. However, if a little thought is given to what we get for that price, it isn't so bad. The filters enable the maximum usable selectivity without any i.f. transformers. Further, this selectivity is obtained at such a high frequency that there is absolutely no need for using double conversion. The image rejection of the completed receiver is very good, even on 10 meters. The selectivity (250 cycles on c.w. and 2800 cycles on phone) is obtained without any "ringing" effect when copying c.w., even in the sharp position. With all of the above advantages, together with the most important fact that the selectivity is just as close to the antenna as seems possible on a tunable receiver, the crystal filters actually become a bargain. Total cost of building the entire receiver will run between $200 and $250, depending upon how carefully you shop for parts. The resulting receiver is, in my opinion, a real bargain.

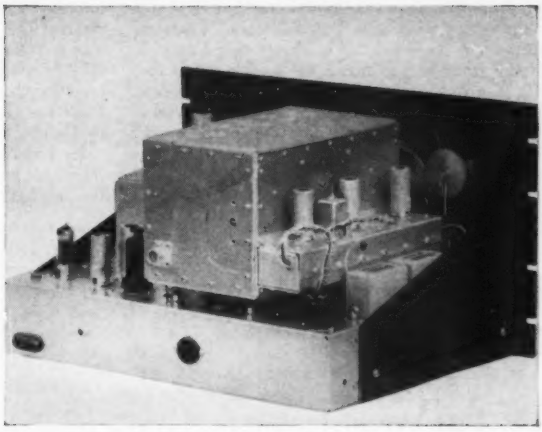
The Circuit

While at first plug-in coils were considered, it was decided to use band switching, as plug-in coils reminded me of the old regenerative job. After all, a plug-in coil receiver just didn't seem to match the all-band switchable transmitter. There are six bands: 80, 40, 20, 15, low 10 and high 10 meters. Bandspread is accomplished by tapping the tuning capacitor down on all coils except the ones on 80 meters. On 80, the entire coils are tuned. Individual air-padder capacitors are used across each coil for alignment purposes. Some of these are shunted with NP0 ceramics to increase the capacitance across the coil. When first constructed, a.v.c. voltage was applied to the

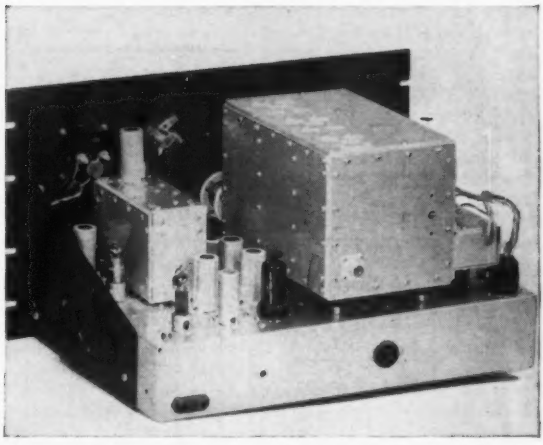
* 451 S.W. Third St., Richmond, Ind.

[1] Main point of the article was that the selectivity in a receiver should be as close to the antenna as possible. To avoid r.f. images, a high i.f. is indicated. Sharp crystal filters at 2.2 Mc. provided the necessary selectivity in the i.f.; another feature was a fast-attack slow-decay "hang" a.v.c. system.

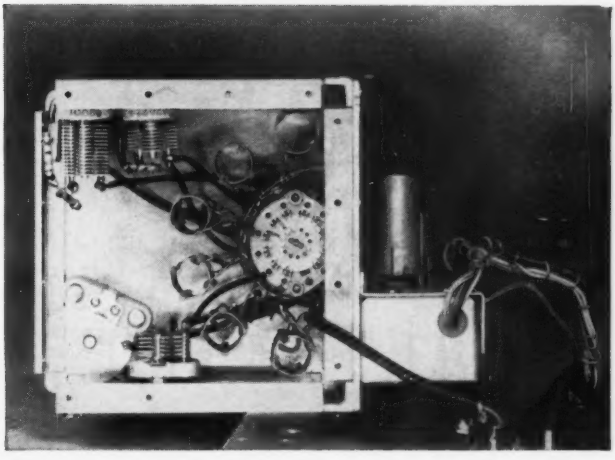
Front view of the W9MUR receiver. The large knob at the upper left is the band switch, and the smaller knob below it turns the 3500-kc. frequency-standard oscillator on and off. Small knobs along the bottom, from left to right, are SELECTIVITY switch, R.F. GAIN, I.F. GAIN, NOISE LIMITER, DETECTOR, A.V.C. switch, VOLUME control and headphone-speaker switch. The knob under the S meter at the right is the PITCH control. Tuning dial is National U.C.; panel is standard 10½ × 12-inch, aluminum.



This rear view of the receiver shows the "box" that houses the receiver front-end section. The gears (Boston H-3264 and H-3296) at the panel drive the band switch. Two rectangular cans at right foreground are the Hycon filter housings.



In this rear view the second detector, b.f.o. (small rectangular can with tube shield, near S meter), and audio section can be seen. The i.f. amplifier tubes are concealed by the r.f. section box. Black object in center is the 3500-kc. crystal.



End view of the r.f. section showing the antenna coils and the associated band switch. The 9½ × 2⅜ × 1½-inch subchassis at the right supports the r.f., mixer and oscillator tubes and the mixer output circuit.

r.f. stage, but this was later changed so that this stage runs "wide open" at all times. A manual r.f. gain is provided but is almost never needed. If the front end is made as in the schematic, Fig. 1, a.v.c. can be easily added to the r.f. stage. However, if this is done, only part of the available a.v.c. voltage should be used, since the 6AH6 used in the r.f. stage has sharp cut-off characteristics.

The 10-meter band is split into two bands, to provide more bandspread. Originally the receiver covered the 11-meter band, but this set of coils was modified to cover the low-frequency end of 10. The coil specifications are also given for covering 10 with one coil for those who might want it. I like the idea of dividing the 10-meter band into two parts.

In order to obtain more reasonable tuning ratios between the oscillator and mixer and r.f., the oscillator is tuned on the high side of the

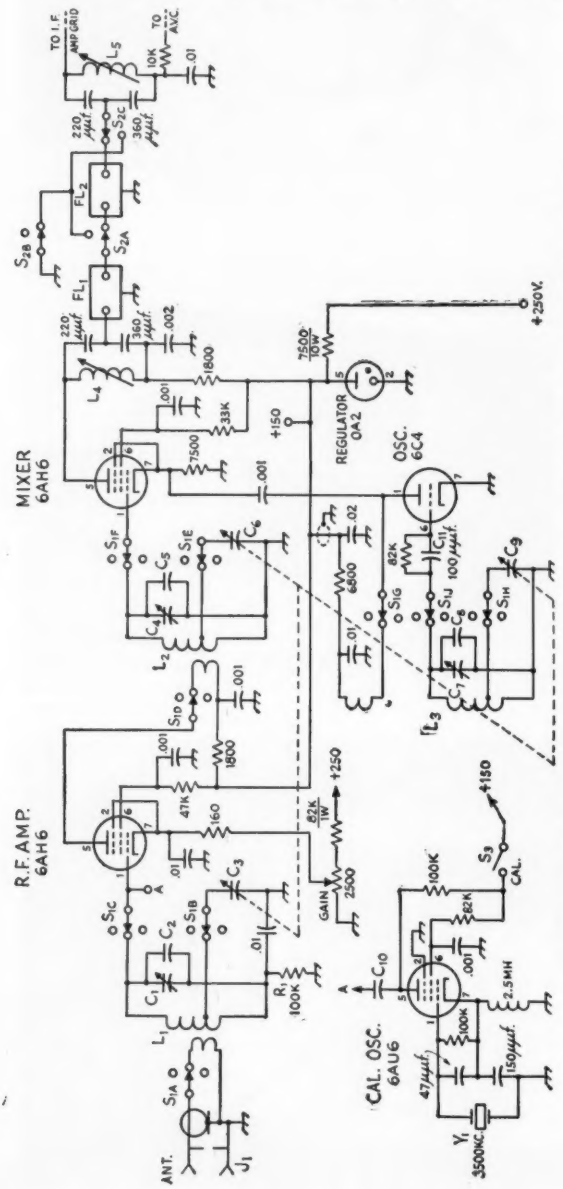


Fig. 1—Circuit diagram of the receiver. "front end." For simplicity, only one set of coils and only three band-switch contacts are shown. Unless otherwise indicated, capacitances are in μf., resistances are in ohms, resistors are ½ watt.

C_1, C_4, C_7—50-$\mu\mu f$. air trimmers (Hammarlund APC-50).
C_2, C_5, C_8—Zero-temperature coefficient ceramic capacitor. See coil chart.
C_3, C_6, C_9—50-$\mu\mu f$. variable (Hammarlund MC-50-S).
C_{10}—Low capacitance, made by twisting two insulated wires.
C_{11}—NPO ceramic.
FL_1—Bandpass crystal filter, 2.215 Mc. (Hycon Eastern 2215KA).
FL_2—Sharp bandpass crystal filter, 2.215 Mc. (Hycon Eastern 2215KB).
J_1—Coaxial receptacle (SO-239).
L_1, L_2, L_3—See coil chart.
L_4, L_5—36-64 μh. adjustable coils (North Hills type 120F mounted in North Hills S-120 shield can). Capacitors across these inductors are silver mica.
S_1—9-pole 10-position (6 used) rotary ceramic switch. All unused contacts connected and shorted out (Centralab GGD sections on P-270 index).
S_2—4-pole (3 used) 5-position (2 used) rotary switch (2 Centralab PA-33 sections on PA-301 assembly.)
S_3—Rotary s.p.d.t. (Centralab 1460).
Y_1—3500-kc. crystal.

carrier frequency on 80 and 40. On 20, 15 and 10 the oscillator is on the low side of the signal to keep the oscillator frequency as low as possible. Cathode injection is used to the mixer. At first, grid injection was tried but it was impossible for me to get anything like uniform injection voltage over the wide range of frequencies covered by this receiver.

A circuit of the S meter is also included since it is a little different than is usually used. Although a 200-microampere meter is shown, almost any meter up to and including a 0–1 milliammeter may be used by proper selection of the cathode resistors and the variable control in series with the meter. With the values given, it is almost impossible to damage the meter by overload.

Construction

Prime objective in the construction of the front end was mechanical ruggedness, since this determines the ultimate shock resistance of the receiver. Careful alignment of tuning-capacitor shafts is necessary to minimize the torque requirements of the dial drive. To these ends, the front end is housed in a three-compartment aluminum "box" made from ⅛-inch sheet stock, securely held together by various angles and brackets. This type of box has the advantage that any side may be removed for accessibility, as shown in the photographs. The band-switch sections are used to support an end of each coil, and common busses of heavy wire support the other ends (see photographs and Fig. 3).

For simplicity and ready alignment, all four sides were made the same (5⅝ by 9½ inches), and the ends and two partitions were made the same (5⅝ inches square). In this way the four sides can be clamped together and drilled at once, as can the ends and partitions. If a drill press is not available and the work must be done with an electric hand drill, clamp only two pieces together at a time, always using the original layout as a pattern. The sides and ends are held together by ⅛ by ½ by ½-inch aluminum angle (Alcoa No. 79-H) tapped for 6-32 screws. The corners of the two partitions must be modified to clear the lengths of angle that secure the sides. As can be seen in the first photograph, the top has clearance holes added so that the trimmer capacitors can be adjusted; clearance holes are also required on the bottom (and the chassis) for the same reason. The success of the entire receiver depends upon precision in the making of the box. If you have difficulty obtaining ½ × ½ × ⅛-inch aluminum angle just get ¾ × ¾ × ⅛-inch angle and cut it down. This is a small job with a metal-cutting bandsaw and can be done by almost any local machine shop at a small cost.

For those who may not have any experience using a small machine-screw tap, extreme care must be used to avoid breaking the tap. Also, some kind of lubricant must be applied to the tap before each hole is tapped. A mixture of about half white lead and half ordinary machine oil works very well. A one-pound can of white lead can be obtained at any paint store and when mixed with an equal amount of machine oil will make enough lubricant for all the holes the average ham will tap in a lifetime. If the tap becomes quite hard to turn and starts to spring just a bit while tapping a hole, back it up about half a turn and then proceed to tap. Between each hole tapping be sure to clean the tap of chips and apply fresh lubricant. When all plates are drilled and all angles are drilled and tapped, the box should be assembled complete without any circuit components mounted, to be sure that all holes line up. At this time the 6-32 all-thread rods should be tried through the two switch mounting holes. The rods should pass through the entire box (two ends and two partitions) freely and without binding.

The box should now be completely disassembled. The 6-32 all-thread rods should be tried in each of the holes on each switch section. It may be found that it will be a little tight in some of the holes since they are intended for No. 5 screws. File the tops of the threads evenly the entire length of each rod until they will slip smoothly through both holes in all switch sections. The use of the No. 6 screw going through the entire box provides the maximum rigidity and very accurate alignment.

The coils may now be prepared. If the layout of the original is closely followed the coils may be made just to specifications and no difficulty should be experienced in final alignment. All coils except the 10-meter set have the spacing occupied by one turn between primary and secondary. The wire is cut at the proper place in the coil and the two ends are peeled back a half turn. This leaves two leads just the correct length for soldering to the heavy wire support semicircles shown in Fig. 3. An easy way to unwrap the half turn from the support bars is to warm the wire with a soldering gun while pulling gently on the end of the wire. The 10-meter coils have no extra space between primary and secondary. The wire at the junction of the two sections of the coil is cut midway between two tie bars. The two ends are bent out at right angles and short lengths of No. 20 solid wire are carefully wrapped one turn around these short tips and quickly soldered, being careful not to melt the retaining cement on the nearby tie bar. The No. 20 wires are then cut to the same length as the leads produced on the other coils. The end of each coil is cut off to provide the correct number of turns in each coil plus the half turns that make up the mounting leads. The coils are supported entirely by the five leads. This seems to give adequate support. While it is possible to notice a ruffling up of a c.w. signal if the table is pounded with the fist, under normal operating conditions the coils are very stable.

The most difficult operation in making the coils is soldering the tap for the bandspread capacitor switch section. The use of spacers made of about four thicknesses of aluminum foil between the turns to be soldered and the turns on each side of it will prevent soldering to more

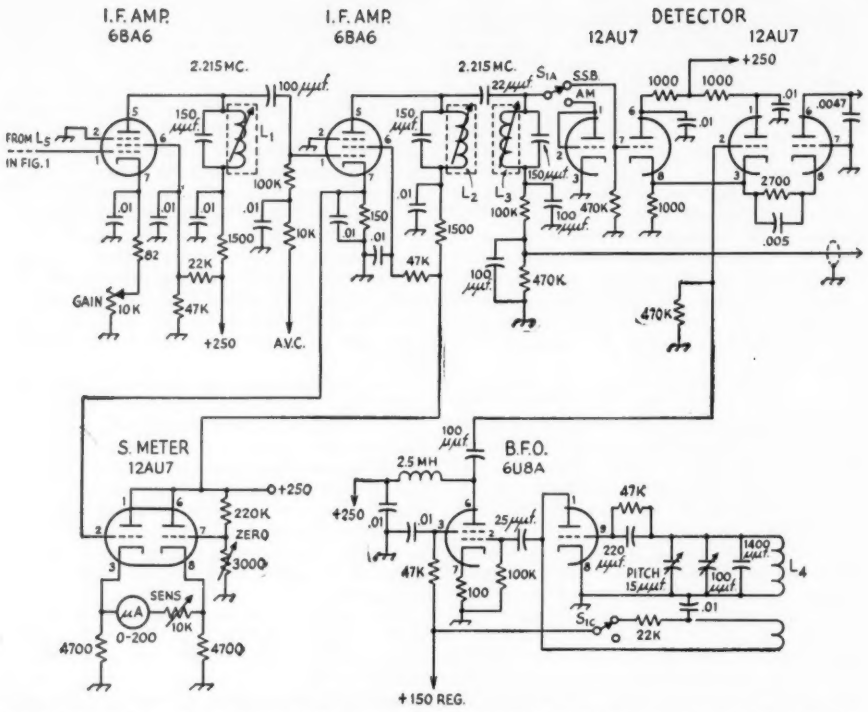


Fig. 2—I.f. amplifier and audio section of the receiver. Unless otherwise indicated, capacitances are in μf., resistances are in ohms, resistors are ½ watt.

L_1, L_2, L_3—36-64 μh. adjustable coils (North Hills type 120F mounted in North Hills S-120 shield can).

L_4—18 turns No. 20, 16 t.p.i., ¾-inch diam. (B&W 3011 stock). Tickler is 9 turns of same, ⅛ inch away.

S_1—4-pole 2-section 5-position (2 used) rotary switch (Centralab PA-1013).

S_2—S.p.d.t. rotary switch (Centralab 1460).

S_3—Two-pole 5-position (3 used) rotary switch (Centralab PA-1002).

T_1—Step-up interstage audio transformer, 1:3 (Stancor A-53 or equiv.).

T_2—7000-ohm-to-voice-coil output transformer 4 watts (Stancor A-3822).

than one turn. In making the taps, use a short piece of the coil wire as there will be plenty of scrap from cutting the coils to size. Bend about ⅛ inch of the end to a right angle and solder this parallel to the desired turn. When the soldering is completed the aluminum foil is removed. This should provide a separation between the soldered joint and the adjacent turns on each side. Be sure to avoid any shorted turns. Start with the 10-meter coils as these are very easy and experience gained will be helpful on the more difficult ones. The only coils that are really "stinkers" to solder the tap to are the r.f. and mixer coils for 40 meters. By the time all the others are tapped these will not be very difficult. The use of 60-40 solder and a fine tip on the soldering gun or iron makes this job easier. As will be noted in the table, the r.f. and mixer coils for each band are identical. When the tap must be other than a complete turn, as on one of the 10-meter coils, the wire for the tap must be run up between two turns to the center of the coil and then out to the proper location on the turn of the coil. Do not wrap the tap wire around the outside of the coil. A piece of spaghetti must be slipped over this wire where it enters the coil between the two turns. The tap lead within the low-frequency 10-meter oscillator coil or the lead within the coil covering the entire 10-meter band can be dressed in such a manner as to cover the exact frequency range desired.

At this time the all-thread rods may be passed through the front end of the box and the index assembly mounted on the outside. The three oscillator switch sections are then mounted, using spacers as indicated in Fig. 3, and a 6-32 nut used to lock the entire assembly of three sections together. The oscillator coils may now be mounted around the switch. The oscillator tuning capacitor is mounted on the front plate. In the same manner, the partition between oscillator and mixer section is slipped over the switch rods, being sure to run 6-32 nuts on both rods before placing the partition on the rods. When the partition is in the approximately correct location, fasten the side panel to the front plate and the first partition

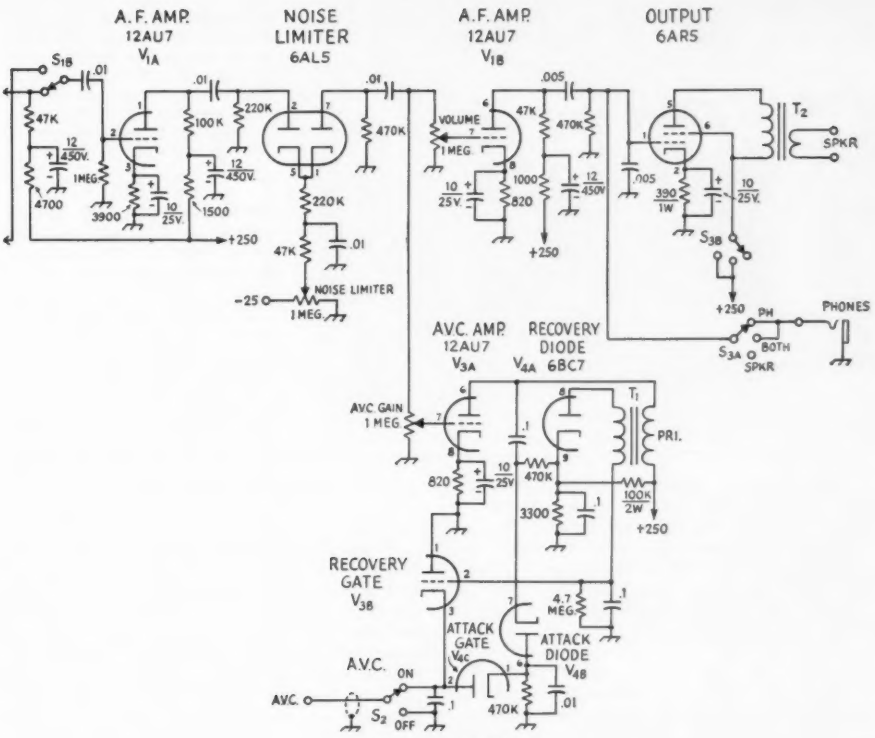


Fig. 2 CONTINUED

by means of the short angles. All screws used to hold the box together (except a few $\frac{3}{8}$ inch long as required) are 6-32 × $\frac{1}{4}$ round-head machine screws

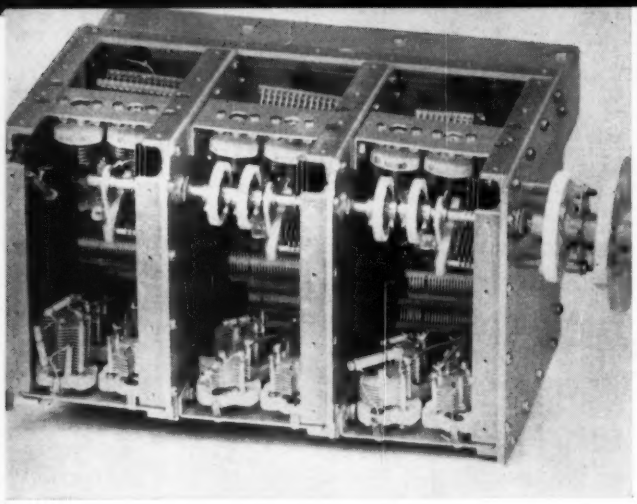
When the partition between oscillator and mixer is mounted on the side plate, the three mixer switch sections may be put in place, in the same manner as the oscillator switch. The mixer coils are now mounted directly on the switch sections. The shafts of the mixer and r.f. tuning capacitors must be cut off to about $\frac{1}{2}$ inch. This will allow the mounting of two Millen 39016 flexible couplings and a short length of $\frac{1}{4}$-inch shaft between each capacitor section. Be sure to use two flexible couplings between each section rather than one, to provide a smooth operating tuning capacitor gang. The mixer tuning section is now mounted on the partition between oscillator and mixer, installing the couplings and short piece of shaft between the couplings at the same time. This process is repeated for the r.f. section. The nuts on the all-thread rods must be very carefully adjusted and tightened in the correct location on the rods to provide correct spacing of the partitions and ends. While this assembly procedure sounds quite complicated, after all coils are prepared the complete assembly of switches, coils and capacitors can be done easily in one evening.

A special flat switch shaft is needed, since even the shaft furnished with the longest index assembly is too short. A 10-inch length is required. The one used in this receiver was made from a piece of $\frac{1}{16}$ × $\frac{1}{2}$ bar stock (obtainable from almost any industrial supply company) cut to $\frac{1}{4}$ inch with a hacksaw and the corners rounded with a file. This special shaft can now be carefully inserted through the switch sections and index assembly. The nine switch sections are quite a load for the shaft but a little contact lubricant, as used on TV tuners, applied to all contacts, will make the entire switch work smoothly.

From now on, the sides are removed only as required to do the additional assembly and wiring. At this time, all of the tuning capacitors should be locked in the same location at the angle shown in the photograph. All couplings should be locked securely with the rotor plates of all three capacitors aligned.

The shelf on the side of the box for mounting the tubes can now be mounted in position. The padder capacitors are mounted by means of small plates of $\frac{1}{16}$-inch aluminum mounted between the partitions. These can be seen in the photographs. Quarter-inch holes are drilled in both the upper and lower covers of the box, in line with the ladder shafts, to clear a small screw driver used in final alignment.

Now that all the mechanical work is completed, the wiring may be done. Just be sure to keep all



The r.f. section with bottom and one side plate removed. Numerous 6-32 screws hold the ⅛-inch thick aluminum partitions and walls to the lengths of ½ × ½ × ⅛-inch aluminum angle. Strips of ⅛-inch aluminum support the trimmer capacitors. The box measures 5⅝ × 5⅝ × 9½ inches.

r.f.-carrying leads as short as possible and rigid, using No. 16 wire. The layout shown seems to give about the shortest leads possible, and no difficulty should be encountered. On switch sections S_{1B} and S_{1C} (Fig. 1) the 80-meter tabs are connected together, since these coils are not tapped and the tuning capacitor must be connected across the entire coil.

Adjustment

While not absolutely necessary, a grid-dip meter is very helpful in aligning the front end. It is suggested that preliminary alignment be done with the filter shorted out and the output connected to the antenna terminal of a receiver tuned to 2215 kc. The tuning range of each set of coils is given on the coil chart. If a grid-dip meter is used, it is very simple to set the tuning capacitor at full capacity and tune the various coils to the low-frequency end of the range. Since it is impossible to insert the grid-dip coil into the various coils, a 6-inch length of twisted pair with a small one-turn loop on each end can be used to couple the meter to the coils. One of the loops is wrapped tightly near the grid-dip coil while the other loop is used as a probe to couple to the coil being tuned. Very pronounced dips should be obtained. If this is not true, look for shorted turns in the coil.

In the absence of a grid-dip meter, an all-wave receiver may be used. With at least one side removed from the box (top), it should be possible to pick up the oscillator signal, using a short wire near the box as an antenna. As soon as the oscillator is tuned to approximately the correct frequency, the converter can be connected to either an i.f. amplifier or a receiver tuned to 2215 kc. When the mixer is tuned through resonance, a definite increase in noise should be noticed. This is also true when the r.f. coils are peaked up. On all bands, the noise of the r.f. amplifier will be much above any other noise in the receiver, if things are working properly. While preliminary alighment can be done with top and bottom plates removed, final adjustment should be made when the box is completely assembled and the antenna connected.

In the absence of a grid-dip meter, a signal generator may be used in the usual way for preliminary alignment. However, I think final alignment can just as well be done by peaking up the noise with the r.f. and mixer padders. Be sure the oscillator is on the correct side of the carrier frequency as noted in the coil table.

Results

No doubt anyone who has read this far is wondering just what to expect from a receiver of this sort. The measured noise figure both at 50 and 100 ohms source impedance is 5 db. or better on all bands. Overload by strong signals near the operating frequency is almost never encountered, thanks to having *all* the selectivity so near the antenna. Over-all stability is very good, provided the i.f. amplifier has a stable b.f.o. The measured warm-up drift, after the first 10 minutes, is a little under 1 kc. on 80 meters and only 3 kc. on 10 meters. Reception of single sideband is very good using a.v.c. without any adjustment of r.f. or i.f. gain controls. The selectivity curve on each of the two filters was given in the original article and seems to be about optimum for phone and c.w.

Notes, Hints and Suggestions

1) The actual i.f. amplifier used in this receiver was a modification of the original, using audio-activated hang a.v.c. as suggested by W9BFL, *QST*, October 1957. However, the carrier-operated system used in the original i.f. amplifier may be just as good or even better. I'm going to try it sometime.

2) A small "calibrate" capacitor could easily be mounted on the right-hand side of the oscillator section and driven by a right-angle drive from the front panel as used by W6TC, *QST*, July 1957. My receiver has the 3500-kc. crystal calibration oscillator.

3) After initial warm-up, the only noticeable frequency instability is due to slight changes in cathode temperatures due to line voltage changes. This could easily be corrected by using a voltage-regulated heater transformer for heating the high-frequency and beat-frequency oscillator cathodes.

4) The b.f.o. used with this receiver is built in a box of similar construction to the front end, using ⅛-inch aluminum.

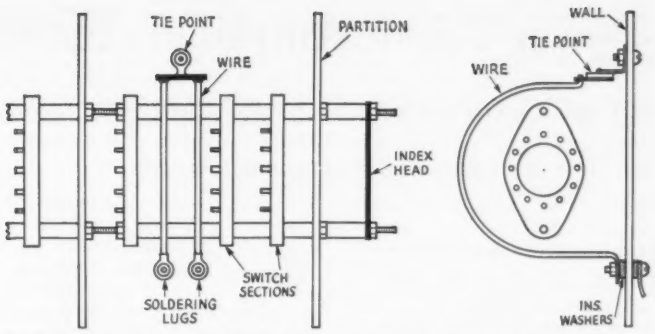


Fig. 3—A heavy wire bus is provided for each coil. The wire is grounded to the chassis at one end only, or when it cannot be grounded for d.c. it is insulated at both ends, as shown here. Insulating washers and suitable hardware provide a feed-through connection. Switch sections held by two lengths of 6-32 all-thread rods.

Coil Table

Band	L_1, L_2	L_1, L_2 Tap, turns from grounded end	C_1, C_2 μμf.	Primary L_1, L_2	Approx. Freq. Coverage Kc.	L_3	L_3 Tap, turns from grounded end	C_3 μμf.	Tickler	Approx. Freq. Coverage Kc.
80 m.	37 t. No. 24, 32 t.p.i., ¾-inch diam. (B&W 3012)	None	62	11 t.	3440 to 4040	18 t. No. 20, 16 t.p.i., ¾-inch diam. (B&W 3011)	None	150	8 t.	5655 to 6255
40 m.	23 t. No. 24, 32 t.p.i., ⅝-inch diam. (B&W 3008)	11 t.	36	8 t.	6970 to 7410	17 t. No. 20, 16 t.p.i., ⅝-inch diam. (B&W 3007)	8 t.	82	7 t.	9185 to 9625
20 m.	17 t. No. 20, 16 t.p.i., ⅝-inch diam. (B&W 3007)	4 t.	None	6 t.	13,970 to 14,360	14 t. No. 20, 16 t.p.i., ⅝-inch diam. (B&W 3007)	5 t.	56	5 t.	11,755 to 12,145
15 m.	12 t. No. 20, 16 t.p.i., ⅝-inch diam. (B&W 3007)	3 t.	None	4 t.	20,910 to 21,750	10 t. No. 20, 16 t.p.i., ⅝-inch diam. (B&W 3007)	3 t.	27	3 t.	18,695 to 19,535
10 m. low half	9 t. No. 18, 8 t.p.i., ⅝-inch diam. (B&W 3006)	2 t.	None	4 t.	27,900 to 28,900	8 t. No. 18, 8 t.p.i., ⅝-inch diam. (B&W 3006)	2¼ t.	27	2 t.	25,685 to 26,685
10 m. high half	Same as preceding	2 t.	None	4 t.	28,800 to 29,800	7 t. as preceding	2 t.	27	2 t.	26,585 to 27,585
10 m. entire band	Same as preceding	2¾ t.	None	4 t.	27,900 to 29,800	7 t. as preceding	2¾ t.	27	2 t.	25,685 to 27,585

5) The power supply is built on a separate chassis in order to minimize the heat generated in the receiver. Power requirements are 6.3 volts at 5 amperes, and 250 volts at 135 ma.

6) When mounting the r.f. unit on the chassis, be sure to use flexible couplings having no backlash between the unit and the dial. The two used in this receiver, as can be seen in the photograph, are large couplings from a TU-10-B antenna tuning unit.

7) Considerable savings in cost can be had by using surplus APC padders, since 18 are required (37 cents each at Burstein-Applebee Co.). I also purchased the S meter, sheet aluminum and a few other items on the surplus market.

8) This front end could be used in a home-built "old fashioned" double-conversion receiver followed by a crystal-controlled converter to a lower i.f. to obtain selectivity.

This receiver has been in use about six months now and it does a good job under today's crowded band conditions. This turned out to be the most interesting construction project that I have ever had and a great deal has been learned about receivers in the process. All the photographs of the receiver are by W9WRL and, by the way, Scotty is now building one just like it. QST

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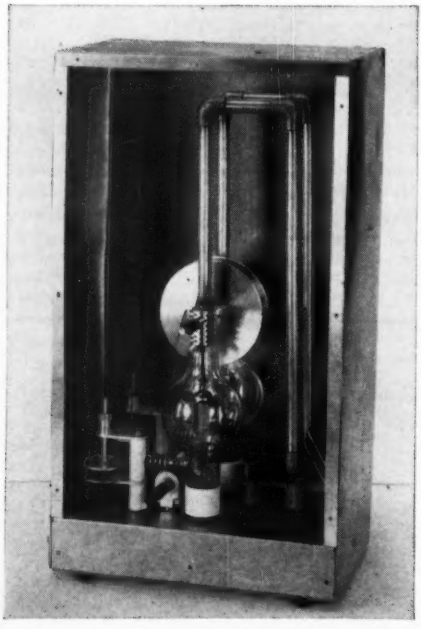
High-Power Triode Amplifiers for 50 Mc.

Improved Tank Circuits Using Standard Plumbing Components

BY ROBERT M. RICHARDSON,* W4UCH

When W4UCH unwrapped his triode amplifiers in the ARRL Lab recently there were mixed reactions on the part of the bystanders. Newcomers to the game hardly recognized the tubes. Triodes — in a transmitter? But old-timers looked long and lovingly at those beautiful big bottles and that wonderfully straightforward circuitry. Nostalgic sighs echoed around the place for days.

But these 50-Mc. amplifiers are no anachronisms. The author makes a very good case for them in v.h.f. service. With surprisingly moderate drive, they deliver a clean signal as fat as the law allows — and they do it with an over-all economy and simplicity hard to equal with tetrodes.



The W4UCH 50-Mc. amplifier with its front cover removed. This is the "small" model using 100THs.

WHEN the 50-Mc. band is open for F_2-layer or sporadic-*E* DX, just about anything in the way of a transmitter will work out well, if it is used on a good antenna system. When a signal is running 60 db. or so above the noise level of the receiver, another 10 to 20 db. is not going to make a great practical difference in communication, unless there is severe interference from other signals on the same or closely adjacent frequencies. Six-meter men have long since ceased to be surprised when fellows 2500 miles away all but block their receivers with Gonset Communicators.

But after the band closes down the low-power enthusiast is back working locals most of the time, and his reliable radius seldom exceeds much more than 50 miles. Too many of these fellows do not realize that they are missing much of interest that the 6-meter band has to offer. Though it has been demonstrated time and again, most amateurs still do not believe that reliable 50-Mc. communication is possible over distances up to 400 miles or so on phone, and as much as 1200 miles on c.w., when an efficient transmitter in the medium- or high-power brackets is employed.

The writer's hobby within a hobby has been for the past few years, working extended-range "groundwave" contacts on 50-Mc. phone. Regular and reliable work has been done with K2RRG, 20 miles northwest of New York City, in Upper Saddle River, N. J., and W3BWU, Pittsburgh, Pa. Other stations worked frequently on a.m. phone include W8SSD and W8CMS in Ohio, W2YYI, upstate New York, W1CLH, Connecticut, W1FOS, near Boston, and many others in Delaware, New Jersey, Pennsylvania, Connecticut and the Long Island area. It should be emphasized that this is consistent coverage, over a period of three years, so such results cannot be attributed to unusual conditions.

A fairly good antenna is a "must" for this sort of thing. A 4-over-4 is used here, and most of the other stations mentioned used stacked arrays of about this size, or larger. Very high power is not absolutely necessary, though it is helpful. Some of the stations listed above run no more than 200 watts or so, but most are in the high-power bracket.

At W4UCH the emphasis has been on efficient triode amplifiers for transmitting. High-power triodes may be out of fashion for work on lower

* Richcraft Electronic Engineering Co., Broad Run Drive, Sterling, Va.

frequencies, but we believe that they have many advantages for use at 50 Mc. and higher. Particularly when efficient tank circuits are used, they work with a degree of over-all efficiency that is hard to equal and well-nigh impossible to beat with any of the tetrode or pentode tubes so commonly used in today's amateur transmitters.

Look over the performance table given herewith for a good idea of what a well-designed push-pull triode amplifier has to offer at 50 Mc. Also, the simplicity of the power supply required, compared to the devices needed with tetrodes of the same power level, is worthy of note. We feel that the amplifiers shown here get to the kilowatt level as simply and effectively as any that can be built today. If simplicity is, as we believe it to be, the epitome of good engineering, these amplifiers take the prize.

Design Features

A look at the schematic diagram will show that there is nothing new circuitwise about these amplifiers. They are exactly like the push-pull cross-neutralized triode jobs that were standard equipment in amateur transmitters on all frequencies, before the days of tetrodes. Only one feature departs from customary design practice, and that is the use of ½-inch copper tubing in the plate tank circuit. The plate circuit design was evolved in 1956, when several months were spent in work on various tank circuits. This size and shape resulted in the highest Q that is practical for a balanced tank circuit capable of handling a kilowatt input at 50 Mc.

A high-Q tank circuit such as this has advantages other than that of high efficiency. Because of its extremely high Q, it will not pass on the higher-frequency components present in the drive from the preceding exciter unit, which so often cause TVI in more conventional but less selective amplifiers. Result: a very low TVI potential.

The crossover neutralization eliminates any possibility of positive feedback through the tubes, a common source of trouble in tetrode amplifiers, even when they appear to be neutralized. A good test of true neutralization and component layout is to run full voltage on the amplifier and tune the grid and plate circuits throughout their entire ranges with no drive applied. Even when no bias is applied to the grids there should be no tendency to oscillation at any point. These amplifiers can be run at a full kilowatt input on a.m. phone at the writer's location in a TV fringe area, without any TVI. This is possible even with the shielding removed.

Construction

Most of the constructional features are visible in the photographs, and dimensions are given for those who may wish to build their own. Two basic amplifiers have been used. One employs a pair of 100THs, and the larger uses 450THs or TLs. As they are essentially the same physical size, 750TL and 1000 T tubes may be used, as well as the Westinghouse 6C21s shown in the photograph of the larger amplifier. Unless you have these tubes on hand, or can get them economically, there is little justification for use of anything larger than the 450s, at amateur power levels.

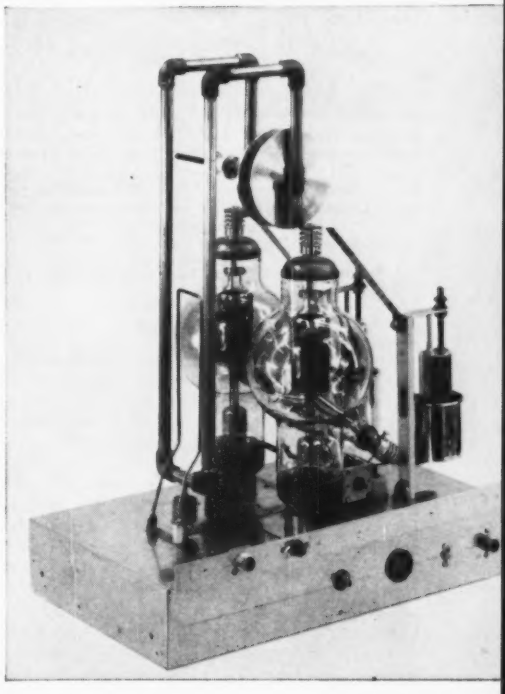
The plate tank circuit is made of ½-inch copper tubing. Right-angle bends are accomplished by the use of standard plumbing components. The plate-power end of the line is mounted on a 500-$\mu\mu$f. high-voltage TV standoff. The power is fed through two r.f. chokes, the common connection of which is bypassed by a similar capacitor, for effective decoupling of the power lead.

Heat-dissipating connectors made especially for this application are used. The front one has a tapped hole to pass a 5/16-inch screw for turning the movable capacitor plate. The tuning capacitor is a disk type, with plates 4 inches in diameter.[1]

The chassis of the 100TH amplifier is 7 by 11 by 2 inches aluminum. A cabinet of sheet aluminum can be made very readily. The only ventilation needed is provided by a 4-inch screened hole in the front panel, at a point adjacent to the large portion of the tube envelope. The top of the case

[1] These parts, the heat-dissipating connectors and the neutralizing capacitors (as well as the complete amplifiers), are available in kit form from Richcraft Engineering Co. at moderate cost, if desired.

The larger model uses 450TL or higher-dissipation triodes of similar dimensions. Tubes shown are Westinghouse 6C21s.



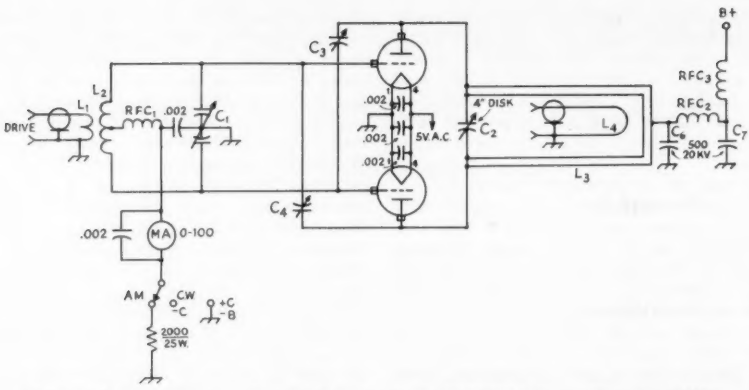


Fig. 2—Schematic diagram and parts information for the W4UCH triode amplifier using 100THs.

C_1—30-$\mu\mu$f.-per-section split-stator variable (Hammarlund HFD-30X).

C_2—Variable capacitor made from 4-inch disks; see photos and text.

C_3, C_4—Disk-type neutralizing capacitor, 1-11 $\mu\mu$f. (Bud NC-853)

C_5—20-μf. 450-volt electrolytic.

C_6, C_7—500-$\mu\mu$f. 20-kv. TV-type bypass.

L_1—2 t. No. 14 enamel, 1¼-inch diam.

L_2—3 t. each side of center, No. 14 enamel, 1¼-inch diam. Space turns so C_1 tunes near middle of range.

L_3—Plate line; see Fig. 1 and text.

L_4—Output coupling loop; see Fig. 1 and text.

RFC$_{1, 2, 3}$—Solenoid v.h.f. choke, 26 t. No. 22 enam. on ½-inch poly rod or tubing.

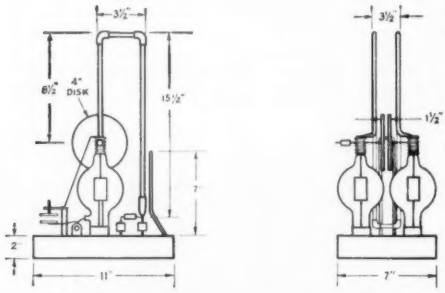


Fig. 1—Principal dimensions of the 100TH amplifier for 50 Mc. Copper tubing and right-angle fittings are standard plumbing items.

can be perforated aluminum or screening. No forced-air cooling is required.

Power Supplies

Not the least of the advantages of these amplifiers is the simplicity of the power-supply setup required. A dual high-voltage supply is recommended by the writer for handling the modulator and amplifier. With a Variac connected in the a.c. line to the primaries of the two plate transformers, the power level can be varied from 50 to 1000 watts, while retaining reasonable balance between the modulator power output and the amplifier input. It is pointless to run a kilowatt to work someone across town, when just a few watts will do exactly as well. In fact, it will be found that a high percentage of all 50-Mc. hamming can be done readily enough with moderate or even low power. It is nice to be able to increase power quickly to the maximum that the law allows, however, and continuously variable control of the a.c. input voltage to the plate transformers makes this possible with a twist of the wrist.

The output coupling link should be adjusted for optimum loading at the highest plate voltage that is to be run. Somewhat tighter coupling will be needed to attain highest possible efficiency at lower plate voltages, but maximum efficiency is not an important consideration in Class C service except at the highest power levels. Proper loading for linear operation is more critical and careful adjustment of the coupling should be made for each plate voltage change, when the amplifier is being used as a linear. QST

Table I

Operating Conditions for the 50-Mc. 100th Amplifiers

Plate Voltage D.C. Volts	Plate Current D.C. Ma.	Driving Power Watts	Input Watts	Output Watts
Class C, Phone or C.W.				
3000	333	20	1000	750
2000	500	30	1000	735
1500	400	15	600	420
1000	300	15	300	200
800	200	8	160	100
Class B S.S.B. Linear, Peak Envelope Values				
3000	600	12	1800	1000
2600	600	16	1200	630
1500	475	17	713	355
1000	340	6	340	195
800	280	5	283	149

The SPARC 6-Meter Transceiver

A Versatile Club-Project

Portable Station

BY L. F. WORTHINGTON,* K4HDX

The complete SPARC 50-Mc. transceiver, showing handset and antenna in place, ready for use. Send-receive switch is under the carrying handle. Switch at lower left edge is for breaking filament and B-plus leads. Left to right along the front are the receiver tuning knob, the regeneration control, the oscillator tuning capacitor, the grid-current tip jack and the double tuning capacitor.

As its name implies, this transceiver was designed and built as a club project of the Spartanburg Amateur Radio Club, Inc. Feeling that there was a great need for a completely self-contained portable for various local communications purposes, we studied the possibilities and concluded that the 6-meter band would best meet our requirements. These included portability, reliability, simplicity and economy. Various published designs were not quite what we wanted, for one reason or another, so we worked out our own. The cooperative effort of W4NTO, K4DTQ and the writer produced the 6-meter portable to be described.

Convenience in use is not necessarily served by the smallest possible package. Form factor, arrangement of controls and carrying properties may be more important than mere small size. We decided on the telephone-type handset as an effective operating combination, and because it could be readily included in the carrying handle. A thin cabinet is used in preference to a square one, for more favorable weight distribution and greater ease in carrying. The case is a standard 10 × 12 × 3-inch chassis with bottom cover. The transceiver unit is in the top and the batteries below.

The Transmitter

A single 3A5 handles the transmitting job. One half of the dual triode is an overtone oscillator, the other a doubler. With the circuit shown, either 8.4- or 25-Mc. crystals can be used. If only 25-Mc. crystals are to be used, L_2 can be omitted, making a somewhat simpler circuit. The unit pictured has a 25-Mc. International Crystal, but several others were built using the circuit with the extra feedback and 8.4-Mc. crystals working on their third overtone. No apparent difference in results was noted.

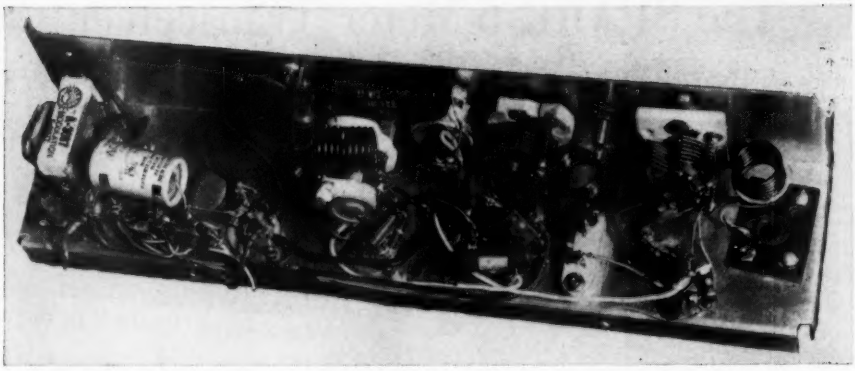
* 418 Crestview Drive, Spartanburg, S. C.

The Receiver

The receiver portion has an r.f. stage, to limit radiation and make the adjustment of the detector less critical. This is followed by a superregenerative detector and two audio stages. The latter also serve as the modulator for the transmitter. Switching from send to receive is done by connecting the filament battery to the tubes required for the purpose, and by grounding the microphone or the earphone.

Note that the method of antenna coupling employed does away with the need for antenna switching. The input circuit is permanently connected to both transmitter and receiver, but no harm is done to the receiver during transmitting periods because the filament of the 1T4 r.f. amplifier is not energized when the transmitter is on. Once the transmitter is adjusted for maximum output the coupling is automatically set for receiving at very close to the optimum loading.

The capacitive coupling between the r.f. and detector stages is done with a "gimmick" of one or two turns of insulated wire around the lead of L_5. This loop is visible in the bottom view, at the center of the photograph, near the ceramic trimmer, C_2. It is shown as C_3 on the schematic diagram. The tuning capacitor, C_1, is an APC-type trimmer, with all but one stator and one rotor plate removed. It is mounted back from the panel, so that it can be turned through an in-



On the underside of the chassis, the antenna mounting is at the right end, along with the transmitter parts. Modulation transformer is at the far left. The detector tuned circuit is at the left center.

sulating coupling or bakelite extension shaft, to reduce hand capacitance.

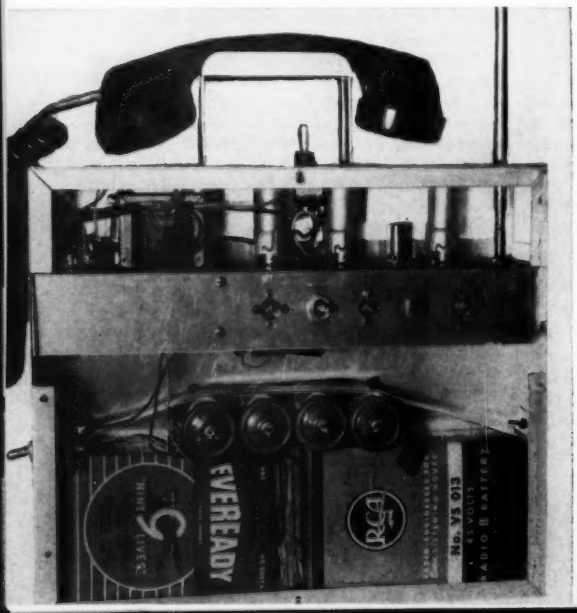
Superregenerative detectors may vary from one unit to the next in the values of grid leak, grid capacitor and plate bypass that give the best results. If the detector operation is not satisfactory, substitution of other values for these items may be helpful. The detector coil, L_5, should be mounted as far from any metal as possible, to preserve its Q. As may be seen from the interior view, this coil extends somewhat below the chassis. Despite its position well away from the metal case, there is enough detuning when the unit is boxed up so that the ceramic trimmer, C_2, must be reset after assembling the case. A small hole is drilled in the back of the case for access to the trimmer adjustment.

The antenna is a 55-inch whip, mounted on a piece of ⅛-inch Lucite. The hole in the top of the case is made larger than the whip and fitted with a Lucite insulator to hold the whip in alignment. Some of our units were fitted with a banana plug and jack, though if the antenna is collapsible this is not necessary. Many methods of mounting and connecting the antenna are possible. Several types of telephone handsets have been used, and the surplus TS13 and TS9 work very well.

Adjustment and Operation

A home-station receiver with an S meter is a convenient indicator for use in tuning up the oscillator and doubler circuits in the transmitter. The circuits should first be resonated approximately to the desired frequency using a grid-dip meter. Grid current may be read with a 1-ma. meter connected between the pin jack, J_1, and ground. This will not be a true reading, but it will serve as a relative indication. Typical readings are about 0.2 ma. with a meter of 50 ohms resistance. The oscillator should be set for the highest grid current that will allow consistent starting. This may be a point slightly detuned from maximum output.

If there is a tendency to oscillation in the first audio stage it may be corrected in either of two



Front view of the transceiver, with pane removed. A tie point at the left carries the connections or the handset. Next are the microphone transformer and the audio tubes, just visible in back of it. The detector and r.f. amplifier tubes are either side of the send-receive switch. At the right are the crystal, the 3A5 transmitter tube, and the antenna.

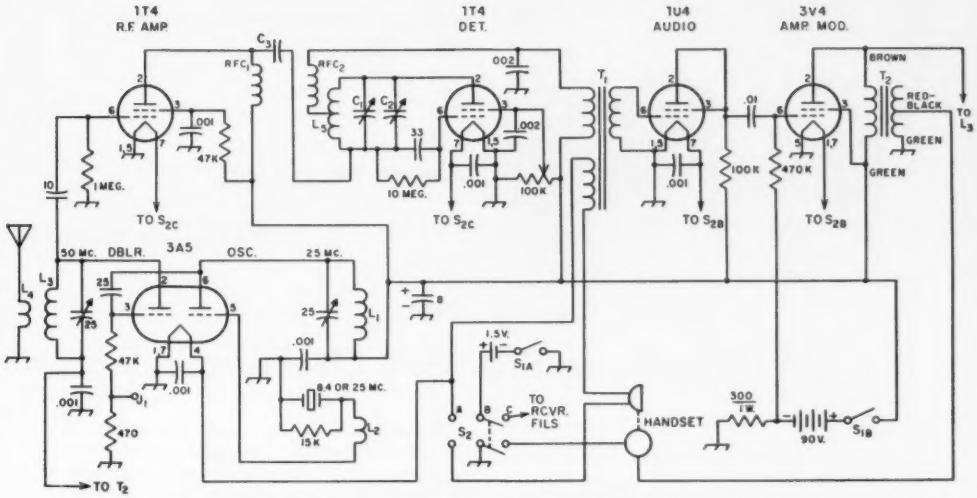


Fig. 1—Schematic diagram and parts information for the SPARC 50-Mc. portable station.

C_1—7-$\mu\mu$f. miniature variable. (See text).
C_2—3-30-$\mu\mu$f. ceramic trimmer.
C_3—Loop of wire around lead to L_7—see text.
J_1—Insulated test jack.
L_1—12 t. No. 20 enam., ½-inch diam., close-wound.
L_2—4 t. No. 20 enam., close-wound 1/16 inch below L_1. Omit if only 25-Mc. crystals are used.
L_3—7 t. No. 14 enam., ½-inch diam., ¾ inch long.
L_4—2 t. insulated wire wound over cold end of L_3.
L_5—9 t. No. 14 enam., ½-inch diam., 1 inch long, center-tapped.
RFC_1, RFC_2—7-μh. r.f. choke (Ohmite Z-50).
S_1A, S_1B—D.p.s.t. toggle switch.
S_2—D.p.d.t. switch with spring return to receive position.
T_1—Transceiver transformer (Stancor A-3833).
T_2—5-watt modulation transformer (Merit A-3007).

ways. A .002-μf. blocking capacitor may be inserted between the transformer and the 1T4 grid, and the grid returned to ground through a 10-megohm resistor. In receiving, the regeneration control should be advanced until the characteristic hiss is heard. The control is then adjusted to suit the level of the incoming signal.

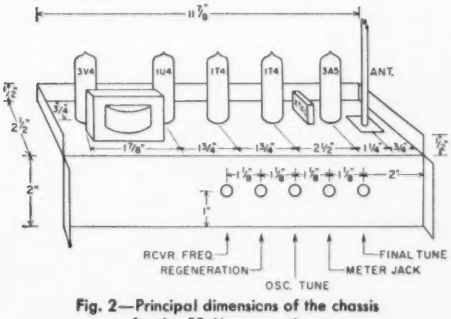
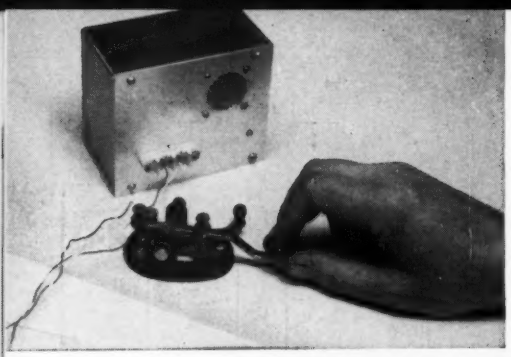


Fig. 2—Principal dimensions of the chassis for the 50-Mc. transceiver.

The modulation transformer, T_2, may be connected Heising style as shown in the schematic diagram, or as an output transformer, if a .1 μf. capacitor is inserted in the earphone lead. Economy-minded members of our club have used the miniature transformer advertised on page 135 of September 1958 *QST* (Arrow Electronics) in place of the Stancor type specified for T_1. Universal output transformers have also been substituted for the Merit transformer, for T_2.

The "B" batteries used are 45-volt units, wired in series to give 90 volts. Type numbers are RCA VS013 or Everready 482. As will be seen in the open view of the equipment, these are in the bottom of the case, with the terminals of each battery toward the middle. They are separated from each other by layers of corrugated paper. Filament and microphone current is supplied by four flashlight cells connected in parallel. These are clamped in place by a metal strap, as shown in the photograph.

QST for August 1958, page 75, carried a picture of several SPARC members with their 50-Mc. portables, the occasion being coverage of the annual Peach Blossom Golf Tournament. The club has handled this tournament in the past using 75-meter mobiles, but the disadvantages inherent in parking cars around the course and the severe 75-meter QRM were among the reasons why the club embarked on the 6-meter portable project. The little rigs were deployed as needed around the course, and scores and other information were relayed back to the clubhouse with ease. The units have served civil defense needs nicely, and amateur radio stock is at an all-time high in the Spartanburg area because of the public service work these transceivers have made possible. QST



Tiny but potent! This photograph shows the completed unit ready for code practice. The small speaker puts out enough volume for group practice.

Loudspeaker Output

with One Transistor

BY LEWIS G. McCOY,* W1ICP

Simple Code-Practice Oscillator

To practice code you need a key and some sort of tone generator that simulates the sound of a radiotelegraph signal. The tone oscillator described here is inexpensive and portable — you don't need an external source of power. By adding a relay, you can also use the gadget for monitoring your keying.

ONE of the requirements for obtaining an amateur license is the ability to send and receive International Morse code. In order to learn to recognize the sound of the different characters, a code-practice oscillator is a required piece of apparatus for the beginner. The oscillator described in this article is capable of producing an audio tone similar in sound to the code signals one hears when listening to the ham bands with a communications receiver.

The volume from the loudspeaker used in the unit is enough to be heard across the average-sized room, making the oscillator suitable for code-practice groups. The oscillator also can be used as a keying monitor by adding a double-pole, single-throw keying relay. Many operators find it difficult to send legible code without monitoring, and the Novice, particularly, needs some method for listening to his own sending when he goes on the air.

The Circuit

As the reader can see from Fig. 1A, the circuit of the code-practice oscillator is quite simple. It consists of a CK722 transistor, a capacitor, a resistor, an output transformer and speaker, and a dry-cell battery. The 9-volt battery used in the oscillator circuit is assembled by connecting six 1½-volt penlite cells in series. The oscillator is keyed by opening and closing the connection between the transformer center tap and the battery.

Fig. 1B shows the connections for adding the keying relay. A relay having a 6-volt a.c. coil is used. One pair of contacts is used to key the transmitter and the other pair to operate the

* Technical Assistant, *QST*.

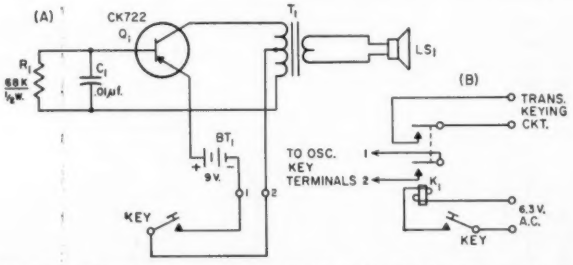
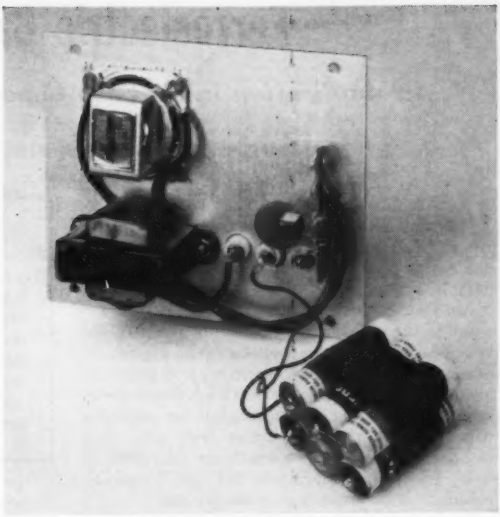


Fig. 1—(A) Circuit diagram of the code-practice oscillator. (B) Circuit for using the code-practice oscillator as a keying monitor.

BT_1—9-volt battery; six 1½-volt penlite cells in series (see text).
C_1—0.01-μf. disk ceramic capacitor.
K_1—Keying relay, double pole, single-throw, 6-volt a.c. coil (Advance GHA/2C/6VA or equivalent).
LS_1—Loudspeaker, 2½ inches, permanent-magnet replacement type. 3.2-ohm voice coil (Allied Radio 81D066, Lafayette Radio SK-39, Argonne AR-95).
Q_1—Transistor, CK722.
R_1—See text.
T_1—Output transformer, 12,000-ohm primary to 3.2-ohm voice coil (Thordarson 22S48)



The speaker is mounted directly above the output transformer T_1. At the right of T_1 is the two-terminal strip (Millen 37302) for the key connections. The remaining components are mounted on the four-terminal tie point.

oscillator. The 6 volts a.c. can be obtained from the transmitter. A commercial rig usually has an auxiliary power socket on the rear, and the power for the relay can be taken from this point; check your instruction manual to see if your rig has such a power take-off. If it doesn't, you can get the six volts either from the heater pins on one of the 6.3-volt tubes in the rig, or directly from the 6.3-volt winding on the power transformer.

Incidentally, the maximum voltage across the key with the contacts open will be only 6.3 volts, so you can't get a dangerous shock if you accidentally touch the key terminals.

Construction Details

The oscillator shown in the photographs is built in a $3 \times 4 \times 5$-inch aluminum box, all components being mounted on one side of the box. Be careful not to mount any of the parts too close to the edge or you won't be able to fit the completed unit into the box.

A four-terminal tie point is used for mounting C_1, R_1, Q_1, and for connecting the leads from T_1. Special care must be taken when soldering the CK722 leads as too much heat can ruin the transistor. When you are ready to mount the CK722 use a pair of long-nose pliers to hold the lead being soldered, grasping the lead close to the transistor body. The pliers will absorb most of the heat before it can reach the transistor.

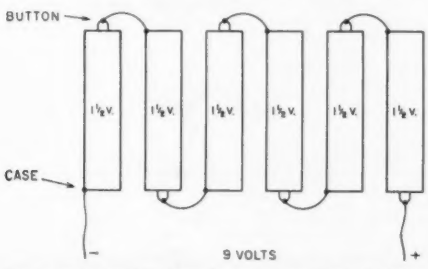


Fig. 2—This drawing shows how to connect the six 1½-volt penlite cells in series to obtain 9 volts for the oscillator. The photograph of the inside of the unit shows how the batteries are taped together to form a single pack.

The CK722 has three leads. The lead closest to the red dot on the body should be connected to one end — either one — of the primary winding of T_1 (the other end goes to C_1 and R_1 as shown in Fig. 1). The center transistor lead should be connected to the junction of C_1 and R_1. The remaining lead goes to the positive terminal of the battery.

Note how the batteries are taped together to form a single pack. In order to connect the batteries in series you must know which are the positive and negative terminals on a single cell. The tip of the cell is the positive, or plus connection, and the metal shell is negative or minus. Connect the cells in series by soldering a short length of wire between the tip of one cell and the case of an adjoining one, as shown in Fig. 2. Then fold the assembly as shown in the photograph and wrap with tape.

After the wiring is finished, connect your key leads to the two terminals and try the oscillator. If you don't like the pitch of the audio tone you can lower it by changing R_1 to 47,000 ohms, or can raise it by using 100,000 ohms at R_1.

Additional Aids for Learning the Code

The Communications Department of ARRL has available, free on request, schedules of code-practice stations, including W1AW, the Headquarters station. Also available is a list of different types of code-practice aids. It is also suggested that the prospective amateur obtain a copy of *Learning the Radiotelegraph Code* (50¢ postpaid from ARRL Hq.) for instructions and practice material. QST

Ferroelectric Capacitors

An Application in an F.M. Capacity-Modulated V.F.O.

BY T. W. BUTLER, JR.,* W8HGY, AND G. A. ROBERTS,* W8YNT

Although the voltage-sensitive capacitors described in this article are a few years old, they have had little or no application in amateur equipment. Here's an opportunity to get acquainted with their characteristics. A practical application in frequency-modulating a v.f.o. is shown, and there could hardly be a simpler way of getting on f.m.!

FREQUENCY modulation of a variable-frequency oscillator (v.f.o.) may be achieved by varying any of the elements of the frequency-determining resonant circuit in proportion to the modulation signal.

An inexpensive and easily varied circuit element is the capacitance. By using recently developed ferroelectric capacitors [1, 2] in a properly designed circuit it is possible to achieve good frequency stability at low cost with adequate deviation for f.m. at the fundamental of the oscillator with modulation voltages of the order of 50 volts. Besides telephony, those amateurs interested in code, teletype, or facsimile can use frequency modulation in a frequency-shift system.

The physical size of two ferroelectric capacitors is shown in Fig. 1 in comparison with a 1-watt resistor, a diode capacitor, and a scale. The University of Michigan experimental capacitor has an initial capacitance of approximately 260 $\mu\mu$f. and can be reduced to about 25 $\mu\mu$f. with the application of 300 volts bias. The "Mucon" capacitor, a commercially available unit, has an initial capacitance of approximately 400 $\mu\mu$f. and is reduced to about 100 $\mu\mu$f. with 300 volts bias.

This article briefly presents the basic design theory and the description of a v.f.o. that is modulated by the University of Michigan ferroelectric capacitor.[3]

Theoretical Circuit Design Considerations

Ferroelectric materials are found to have a dielectric constant that is a function of the applied electric field (bias) and temperature. For a typical capacitor fabricated from a wafer 0.005-inch thick and approximately 0.02 × 0.02 inch square operated at 39 degrees C., the variation of capacitance as a function of applied bias voltage is shown in Fig. 2. For this same capacitor biased at 150 volts the capacitance *vs.* temperature is shown in Fig. 3.

By biasing the ferroelectric capacitor to a middle value and adding to the bias a modulation signal it is possible to get a capacitance variation that is a monotonic function of the modulation signal. If this capacitor is then placed in the resonant circuit of an oscillator, an f.m. modulator is obtained (see Fig. 4A).

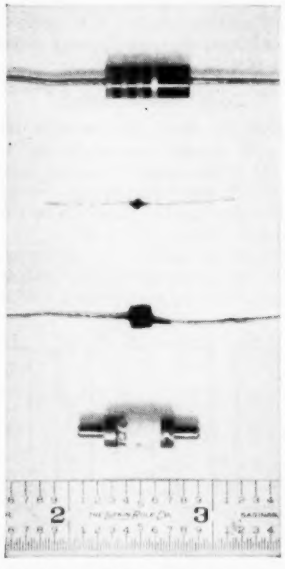


Fig. 1—Typical sizes of ferroelectric capacitors. (A) 1 watt resistor. (B) University of Michigan ferroelectric capacitor (200 $\mu\mu$f.) (C) commercially available ferroelectric capacitor (400 $\mu\mu$f.) (D) diffused silicon nonlinear capacitor diode (2 $\mu\mu$f.).

* The University of Michigan Research Institute, Ann Arbor, Michigan. This work was sponsored by the U.S. Army Signal Corps.

[1] Butler, Diamond, Orr, "Sub-Miniature Non-Linear Capacitors for Application to VHF Wide-Range Tuning Devices," *Proc. of the National Electronics Conference*, October, 1955, p. 839.

[2] Butler, "Packaged Electric-Tuned Panoramic Receiver for 35–200 Mc. Range," *Proc. of the National Electronics Conference*, October, 1957, p. 115.

[3] This experimental ferroelectric capacitor may be replaced by a commercial unit with only slight changes in the value of the series and shunt capacitors. To the best of our knowledge the Mucon (available from Mucon Corp., 9 St. Francis St., Newark 5, N. J., for approximately $1.50) is the least expensive and most sensitive capacitor commercially available. If there is enough demand, it is quite possible Aerovox might produce units similar to the U. of M. model. Those interested in fabricating their own capacitors should request 0.005-inch thick silvered wafers of HI-Q-91 from Aerovox and consult the reference in Footnote 1 for some information on fabrication.

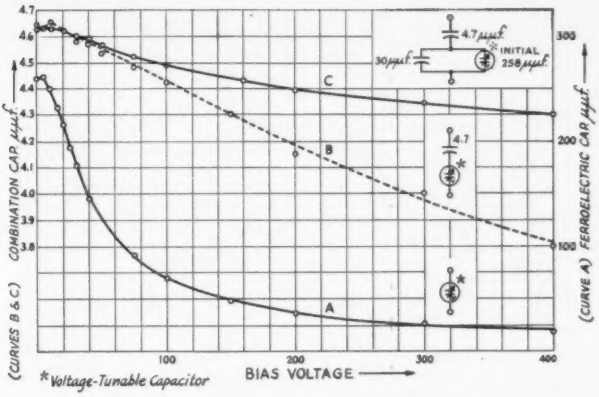


Fig. 2—Capacitance vs. voltage for typical experimental U. of M. capacitor. (A) Ferroelectric capacitor; (B) ferroelectric capacitor in series with a silver mica; (C) ferroelectric in series with a silver mica and shunted by a silver mica. Ferroelectric operating temperature 25 degrees C.

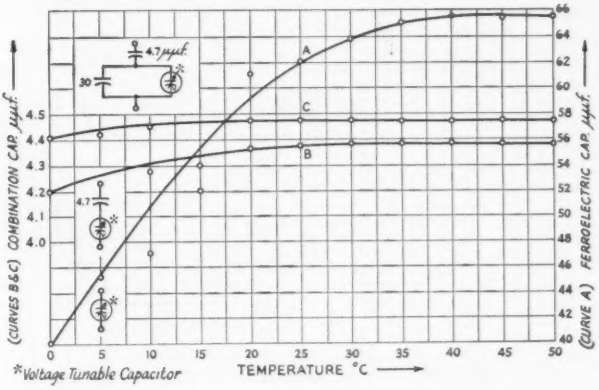


Fig. 3—Capacitance vs. temperature for typical experimental U. of M. capacitor. (A) Ferroelectric capacitor; (B) ferroelectric capacitor in series with a silver mica; (C) ferroelectric in series with a silver mica and shunted by a silver mica. Ferroelectric biased at 125 volts.

If C_2 is large compared to C_F then the resonant frequency is determined by C_F and L. In this case large changes in frequency are possible, on the order of 3 to 1. This large change will result either from a voltage or temperature change; thus, this circuit would give very poor temperature stability. However, it should be noted that such a large degree of voltage tuning is not required for f.m., although this configuration could be used by putting the ferroelectric capacitor in a thermostatically controlled crystal oven and using a d.c. bias voltage for center frequency tuning and applying a very small signal for modulation. Of course, the 3-to-1 tuning range is still excessive and should be reduced. For some amateurs this might be experimentally interesting. For those amateurs interested in modifying present v.f.o.'s a different approach should be used.

V.f.o. center frequency stability is a principal design interest. The required percentage change in capacitance of the resonant circuit is small because the percent change in frequency is small. For instance, for narrow-band f.m. at 4 Mc., L and C might be 20 μh. and 80 $\mu\mu$f., respectively. To achieve a 3-kc. deviation would only require C to change by 0.12 $\mu\mu$f.

The circuit Fig. of 4B will give the desired deviation with the minimum temperature depend-

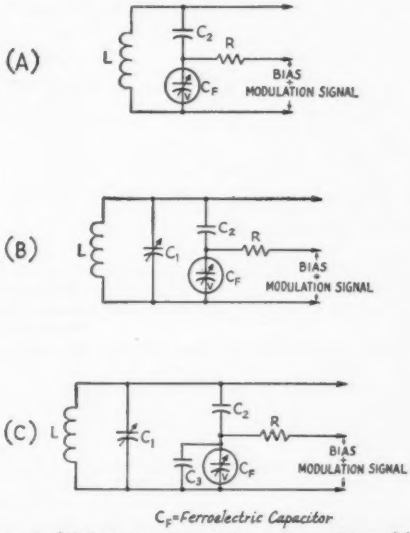


Fig. 4—(A) Basic tuned circuit for an f.m. oscillator. (B) Tuned circuit for an f.m. oscillator to achieve high stability. (C) F.m. oscillator tuned circuit for multiband operation. C_3 is used to reduce the deviation when operating at harmonics of the oscillator frequency.

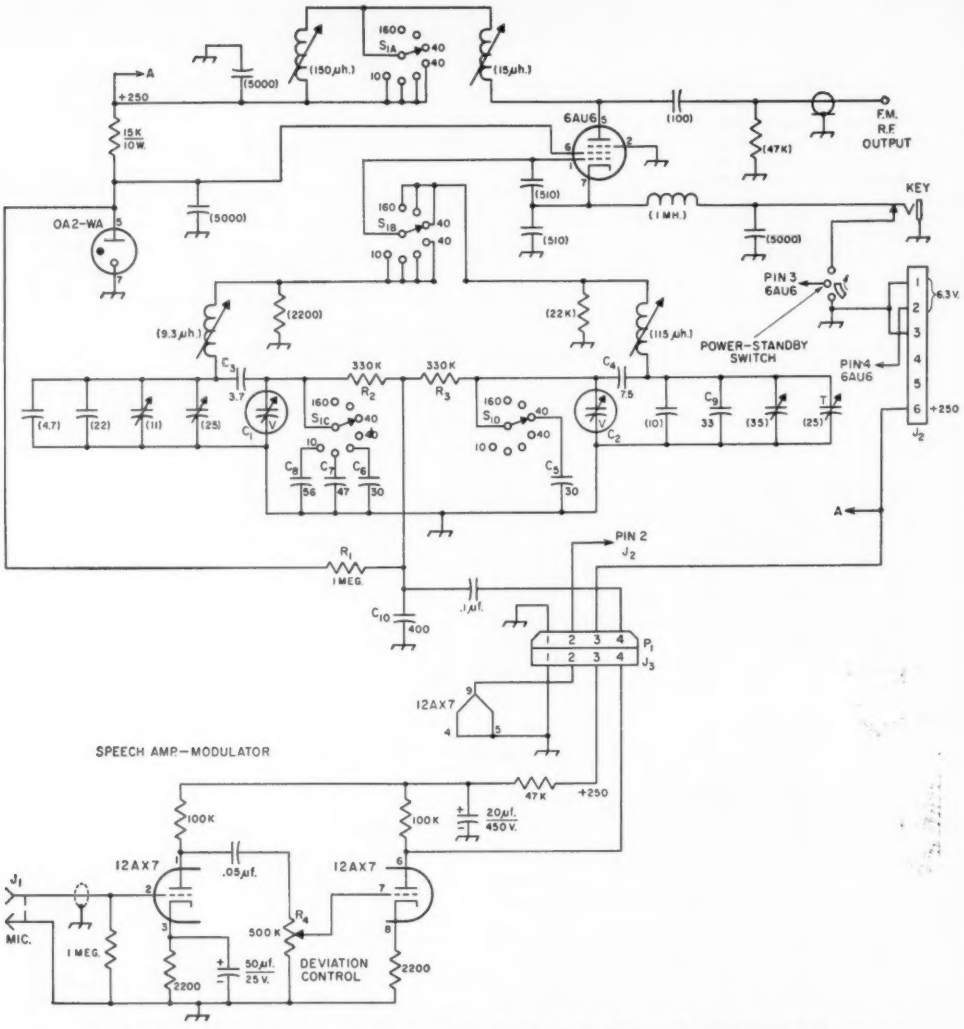


Fig. 5—Circuit for commercial v.f.o. kit modified for f.m. This circuit uses U. of M. experimental ferroelectric capacitors, but commercially available capacitors may be used with only slight changes. Capacitances are in μμf. unless otherwise indicated; capacitors with polarities marked are electrolytic. Resistors are ½ watt. Values in parentheses are unchanged from the original v.f.o. circuit

C_1, C_2—Ferroelectric capacitors, 200 μμf. initial capacitance.
C_3—Ceramic NPO (1.5 and 2.2 μμf. in parallel).
C_4—Silver mica (two 15-μμf. units in series).
C_5-C_9, inc.—Silver mica.
C_{10}—Mica.
J_1—Microphone connector, chassis mounting.
J_2—6-prong cable connector, male (Jones P-306-CCT).
J_3—4-prong chassis connector, male (Jones P-304-FP).
P_1—4-prong cable connector, female (Jones S-304-CCT).
R_1, R_2, R_3—Composition, ½ watt.
R_4—0.5-megohm control, audio taper.
S_1—4-pole, 7-position ceramic rotary

Note: 11-meter position in original v.f.o. circuit eliminated.

ence when C_2 is properly selected. (Here tuning is done with C_1.) To achieve this result C_F should be modulated so that a maximum capacitance change is obtained that is reasonably linear. For a typical capacitor this may be a change of 50 μμf.[4] Now this large change in capacitance must be reduced to a smaller change across C_1. This is done by

[4] C_2 could be replaced with another ferroelectric capacitor if ferroelectric capacitors of 0.3 μμf. could be made.

making C_2 small. Curves B in Figs. 2 and 3 are for typical series combinations of C_2 and C_F. Consider C_F to have a capacitance of 62 $\mu\mu$f. when biased at 125 volts. From Fig. 3 it is seen that for a 50-degree C. change in temperature the capacitance varies about 26 $\mu\mu$f. Thus, if the v.f.o. was designed to give 3-kc. deviation for a change of 50 $\mu\mu$f. in C_F this temperature change would only result in a 1.6-kc. shift of the center frequency. Normal temperature changes will be much less.

Capacitor C_2 serves three purposes: (1) it provides a high impedance to ground for both the bias and modulation voltages; (2) it reduces the change in capacitance C_F to a smaller value across L and C_1; and (3) it multiplies the effective Q of the circuit. If the Q of C_2 is large the Q of C_2 and C_F in series is approximated by

$$Q = Q_v \frac{C_2 + C_F}{C_2}$$

where Q_v is the Q of C_F. If C_F is very much larger than C_2, as it is in the practical case, the effective Q of the circuit is greatly improved. This is important since the Q of commercial ferroelectrics may not be too good.

When the same v.f.o. is used for multiband operation it is necessary to change the deviation in order to maintain a constant deviation from band to band. This is most easily achieved circuitwise by switching in additional padding capacitance across C_F (as in Fig. 4C). Curves C of Figs. 2 and 3 show typical characteristics for this case.

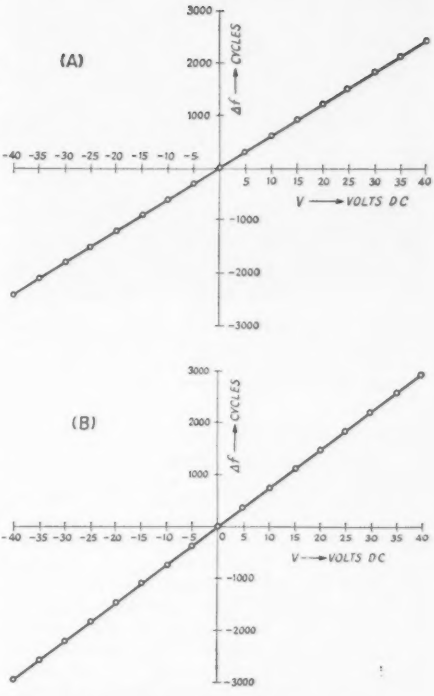


Fig. 6—(A) Measured deviation for the f.m. v.f.o. (f_o = 7.2 Mc.). (B) Measured deviation at 28.8 Mc. (set on 10-meter switch position). D.c. voltage shown is the change in volts from the initial bias of 150 volts.

Practical Circuit Design Considerations

To demonstrate the feasibility of n.f.m. a typical commercially available all-band v.f.o. (Heathkit VF-1) was modified as shown in Fig. 5 and the accompanying photographs. The basic circuit is the series-tuned Colpitts or "Clapp" oscillator circuit. The tank circuit consists of two separate coils and two separate stator connections of a ganged capacitor to develop the basic output frequencies. The basic output frequency in range 1 is 1.75 Mc., doubling to 3.5 Mc., and quadrupling to 7 Mc., while the basic output frequency in range 2 is 7 Mc., doubling to 14 Mc., tripling to 21 Mc., and quadrupling to 28 Mc. Padder capacitors are placed in parallel with the sections of the ganged tuning capacitor for adjustment. Following the discussion above, a series arrangement consisting of a 7.5-$\mu\mu$f. silver

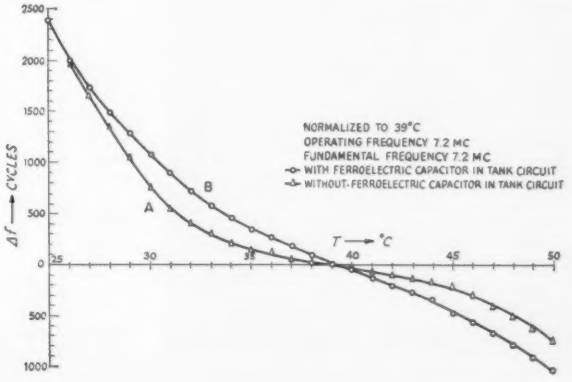
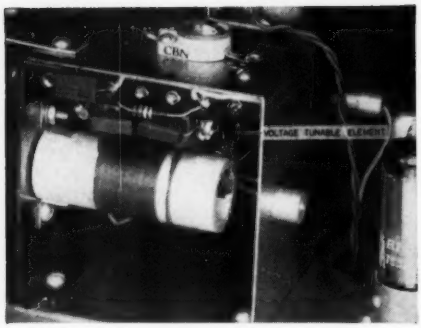
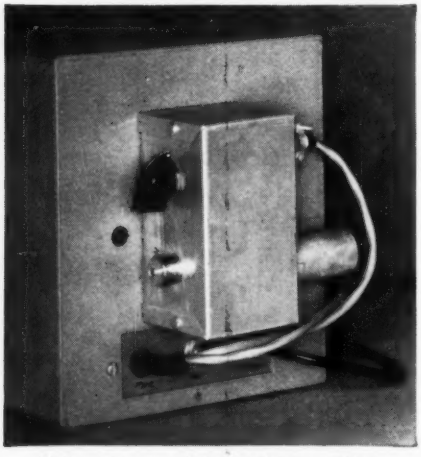


Fig. 7—V.f.o. temperature stability. (A) Ferroelectric capacitor shorted out. (B) Including the ferroelectric capacitor.



Mounting of the ferroelectric modulating capacitor. One circuit layout precaution should be taken: the lead from C_2 to L and C_1 (Fig. 4C) should be short and mechanically rigid. Other leads are not too critical.

mica capacitor and a 200-$\mu\mu$f. ferroelectric capacitor are connected across range 1 of the tank circuit while a second series arrangement consisting of a 3.7-$\mu\mu$f. NP0 capacitor and a 200-$\mu\mu$f. ferroelectric capacitor are connected across range 2 of the tank circuit. According to FCC regulations the channel width for n.f.m. should not exceed twice the highest audio frequency in the modulating signal; therefore, based on an upper audio limit of 3 kc., the channel width should not exceed 6 kc. In band-switching operation the modulation index is multiplied by the same factor that the carrier frequency is multiplied by. Therefore, if the basic output frequency is 7 Mc., for example, with a frequency deviation of 2 kc., the output at 28 Mc. (i.e., the fourth harmonic of the basic output frequency) will have a deviation of 8 kc., which is far too great. In order to maintain a constant deviation for a given modulation voltage, additional padding is switched across the ferroelectric capacitor as the band is switched to higher frequencies. Since n.f.m. is not allowed in the 1.75-Mc. band, the basic output frequency was considered to be 3.5 Mc. and the deviation adjusted at this point to be approximately ± 2 kc. for a change in bias of ± 40 volts. For 7-Mc. operation a 30-$\mu\mu$f. padder, C_5, is switched across the ferroelectric capacitor as shown in the schematic. With this arrangement deviation in the 1.75-Mc. band would be one-half of the deviation obtained in the 3.5-Mc. band, or about ± 1 kc. The basic output frequency in range 2 is 7 Mc. and the deviation is adjusted at this point to about ± 2 kc. for a change in bias of ± 40 volts. For operation at 14, 21, and 28 Mc. additional padding capacitance is switched across the ferroelectric as shown.



Outboard location of the modulation amplifier.

The ferroelectric capacitor bias voltage is 150 volts and is taken from the plate of the OA2-WA regulator tube. Decoupling of the r.f. and a.f. signals from the bias is obtained by means of the 1-megohm resistor, R_1. Capacitor C_{10}, and R_2 with C_1 or R_3 with C_2 and other parallel capacitors limit the high-frequency response of the modulator. The principal components that decouple the two r.f. tank circuits and decouple the r.f. from the audio amplifier are R_2, R_3 and C_{10}. When constructing this portion of the circuit it is important to keep all leads short and rigid at the junction of R_2 with C_1 and R_3 with C_2. Note that C_9 is 33 $\mu\mu$f. instead of the 47 $\mu\mu$f. used in the Heathkit VF-1.

The modulator section is a two-stage audio amplifier utilizing a 12AX7 in a straightforward circuit. The gain control, R_4, at the input to the second audio section, serves as a deviation control. Since the amplitude variations at the plate of the audio amplifier determine the deviation of the oscillator, controlling the input signal to the audio amplifier also controls the deviation of the oscillator. The optimum setting of this control will vary somewhat from band to band and is best determined by operational checks. The final setting should correspond to a deviation of somewhat less than 3 kc.

The modulator was constructed in a 2¼ × 2¼ × 4¼-inch Minibox and mounted outboard fashion on the rear of the v.f.o. Audio leads were brought into the v.f o. through shielded cables.

Since this particular v.f.o utilizes two tuned circuits in order to obtain band spread, it was necessary to replace the existing band switch with a four-section, seven-position, nonshorting type of ceramic switch. In most v.f.o. modifications, where the tank is a single tuned circuit, band-switch modifications will be much simpler. In any event, all modifications can be made by following the ideas presented in earlier sections.

Recalibration of the v.f.o. should follow standard procedures as outlined in most radio handbooks.

Performance Characteristics

The oscillator frequency deviation on each band was measured by using a frequency counter in conjunction with a stable frequency source.

(*Continued on page 142*)

VXO-II

Variable-Frequency Crystal Exciter

BY HERMAN SHALL,* W3BWK

The VXO-II gives continuous crystal-controlled frequency coverage of the 80-, 40-, and 20-meter bands without frequency multiplication. Fixed crystals are at the left; variable crystals (each covering 10 kc.) are at the right. The center knob gives vernier tuning over each 10-kc. segment. The mixer and output amplifier tubes are at the rear, with the tuning slugs of the plate coils projecting through the chassis. Tube shields were removed from the oscillator tubes in this view, but should be in place when calibrating.

Further developments of the VXO circuit described in January 1958 QST. Two applications are discussed: one a two-band Novice version giving discrete crystal-controlled channels, closely spaced; the other, a continuously-variable three-band frequency-control unit with vernier tuning and high stability. Neither approach requires frequency multiplication.

THE crystal oscillator is the ideal means of controlling the frequency of a transmitter. No other technique gives such high stability and resetability with such ease of adjustment. Unfortunately, no other frequency control system is so rigidly inflexible. The user, in the past, has been truly "rockbound" to one spot in the spectrum for each crystal.

The advanced amateur appreciates the advantages of crystal stability for s.s.b. and c.w. operation under conditions of maximum receiver selectivity but, in practice, v.f.o. flexibility takes precedence over other very desirable characteristics. The poor Novice, however, relegated to small overcrowded bands, regulated to mandatory crystal control and "regusted" with his lot, wants a v.f.o. just like the "General" but he has no choice; he *must* use crystals.

The solution is simple, if money is no object; use multiple-position switches and a crystal for every channel you wish to work. Space is not a problem because we could switch hundreds of subminiature crystals in the space required by the average v.f.o. However, money is a problem, not only for most of us but for most commercial interests and even Uncle Sam.

Here is a variable crystal oscillator system that solves the crystal and v.f.o. problems at once and throws in a few extra features for good measure. These features are:

1) *Stability* — better than that of the normal crystal oscillator because of the heterodyne principle, which cancels at least part of any small drift caused by temperature changes when using the difference frequency, if both crystals drift in the same direction.

2) *Resetability* — equal to crystal.

3) *Flexibility* — with instantaneous frequency change to any part of band.

4) *Past Warmup* — exciter is operative and stable within the 45 seconds it takes for tubes to reach operating temperature.

5) *Multiband Output* — without frequency multipliers.

The military, the airlines and many commercial mobile communications users eat their cake and have it too by applying this technique in a family of units called "frequency synthesizers" or "crystal savers." (Try saying "synthesizer" after one beer!) These vary in complexity from equipments that give as many as 2000 crystal-controlled channels from one crystal to those that give 600 channels from 100 crystals. Weight, size and initial cost determine the most practical compromise. In general, it is usually cheaper to use 50 to 100 crystals with simplified circuits than 1 to 10 crystals with complex circuitry.

The synthesizer can solve the amateur's problem just as easily as it solves the commercial interests' problem, and herein lies a tale. If the ham is to build a crystal saver, the circuitry must be relatively cheap, simple and easy to assemble. The rigs to be described are elementary forms of crystal savers. They are cheap, fairly easy to build, super-stable and perfectly resetable. Basically the system is that used in the VXO and other beat-frequency systems described in *QST*[1,2] and the *Handbook*. Two oscillators at different frequencies outside the amateur bands produce new frequencies inside a ham band when combined through a mixer (see Fig. 1).

To produce a ham channel (from now on we shall refer to mixer output frequencies as *channels*) we could use a 16,500-kc. crystal in oscillator *A*,

* Piezo Crystal Company, Carlisle, Pa.

[1] Shall, "VXO — A Variable Crystal Oscillator," *QST*, January, 1958.

[2] Bartlett, "A Beat-Frequency Exciter for Better C.W. Signals," *QST*, June, 1952.

and a 20,010-kc. crystal in oscillator *B*, tune the mixer to 3.5 Mc., and out would come the *difference* between the two frequencies, 3510 kc. One channel from two crystals doesn't seem to be much of a bargain, but watch how fast the rabbits come out of the hat. Add a 16,495-kc. crystal to oscillator *A*, and a 20,020-kc. crystal to oscillator *B*. A little quick arithmetic will show that each crystal in the oscillator *A* can be used with each crystal in the oscillator *B* to make four different combinations in the 3.5-Mc. band. We now have four channels for four crystals and are at least even. But wait, it gets even better! The number of channels increases as the *square* of the number of pairs of crystals we use!

Pairs of Crystals	*Channels*
1	1
2	4
3	9
4	16
5	25
6	36

You can see that for the Novice, at least, we reach a practical limit very rapidly. Ten crystals will give 25 channels in the 3.5-Mc. band at 2-kc. intervals. We can use the same 20-Mc. crystals in oscillator *B* with five more around 13 Mc. in oscillator *A* to produce 25 difference-frequency channels at 2-kc. intervals in the 7-Mc. band. Finally, we can add five more crystals to the 20-Mc. group and get a total of 50 channels each in the 3.5- and 7-Mc. bands at 1-kc. intervals. Truly a real lily-gilder with 100 channels and only 20 crystals. See Table I for a recommended set of frequencies. It is possible to utilize *both* sum and difference frequencies to get more channels with fewer crystals, but protection against spurious radiation usually costs more than the few extra crystals. We hope to cover this technique in a later article.

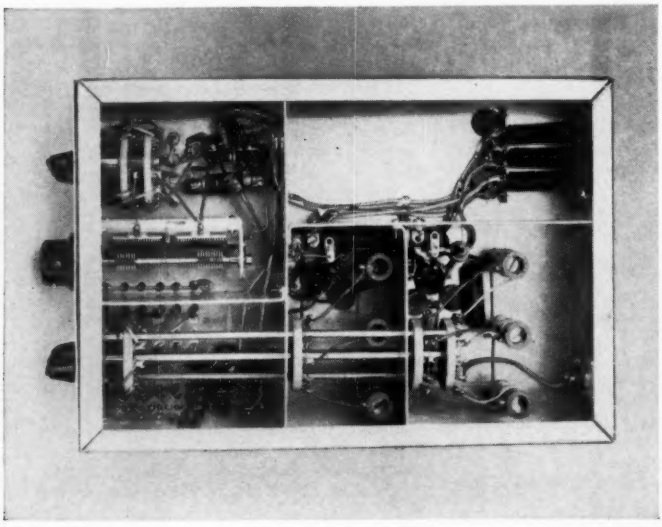
A big problem in adjusting crystals to exact frequencies arises from the fact that the crystals and the using oscillator circuit must be designed as a unit. Even when this is done, the usual practice is to allow 20 cycles per megacycle as a manufacturing tolerance and then adjust the crystals to exact frequency in the circuit. This is the function of the trimmer capacitors in parallel with the crystals. Crystals with low activity, when so trimmed, lose output voltage or stop oscillating. Therefore active crystals are required. It is to be expected that crystals made for other oscillators will operate at frequencies sometimes several kc. from those marked on the cases, with the differences becoming greater as the frequency rises.

Since attempting to trim some surplus crystals to frequencies in the schedules may make them inoperative, the trimmers can be eliminated. The frequency spacings in the schedules are not really important. It's just a convenience to be able to think in exact frequencies and uniform steps rather than odd values. Either approach gives satisfactory coverage of a band. If exact frequencies are desired, there are several good articles in past *QST*s [3] that tell how to make crystal frequency adjustments. Be sure to adjust the crystals to frequency *in the VXO oscillator you build*.

Construction Hints

The basic VXO-II exciter provides a series of fixed frequencies as described above and is the type recommended for Novice use. But since the Novice license period is only a temporary phase of the ham's career, it makes good sense to look ahead a bit in building equipment, and the VXO-II unit shown in the photographs has been designed with eventual "General" operation in

[3] For example, Newland, "A Safe Method for Etching Crystals," *QST*, January, 1958.



The bottom of the VXO-II is divided into compartments enclosing the various stages. The variable oscillator is at the upper left, fixed oscillator at the lower left, mixer at bottom center, and amplifier at lower right. The band switch, bottom, is an assembly of standard switch components, with one switch position for each 100-kc. band. The upper-right compartment houses incoming supply leads and filters TVI (not shown in Fig. 1) of the type described in the TVI chapter in the *Handbook*.

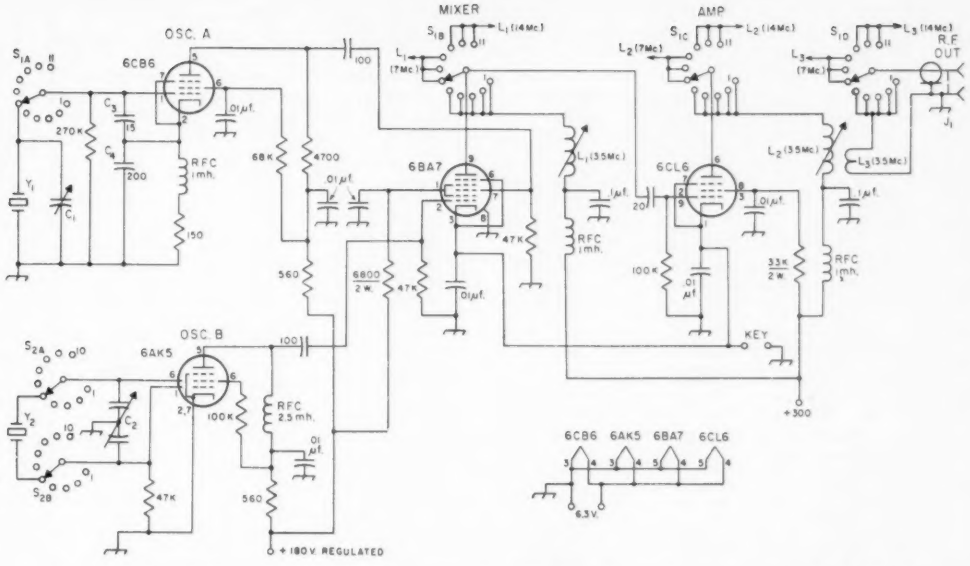


Fig. 1—Circuit of VXO-II, using variable-frequency crystal oscillator for continuous frequency coverage in the 3.5-, 7- and 14-Mc. bands. Unless indicated otherwise, capacitances are in μμf., resistances are in ohms, resistors are ½ watt. 0.01-μf. fixed capacitors are disk ceramic; 0.1-μf. capacitors are paper; others are mica. Bottom ends of L_1 coils for the three bands are connected together while top ends connect to contacts on S_{1B} as indicated; similarly for L_2 and S_{1C}, and for L_3 and S_{1D}.

C_1—1.5–20-μμf. midget mica trimmer (Arco or El-Menco 402).
C_2—Dual 140-μμf. variable modified as described in text.
C_3, C_4—Silver mica.
J_1—Coax fitting, chassis mounting.
L_1, L_2, L_3—See table below.
S_1—Ceramic rotary, 4 poles, 11 positions.
S_2—Ceramic rotary, 2 poles, 10 positions used.
Y_1, Y_2—See text for frequencies. Y_1 crystals used in unit shown are Piezo Crystal Co. VXO-2A; Y_2 crystals are VXO-2S.

Coil Data

Band	L_1	L_2	L_3
3.5 Mc.	88 turns No. 36	100 turns No. 36	5½ turns
7 Mc.	30 turns No. 31	36 turns No. 31	4 turns
14 Mc.	26 turns No. 24	31 turns No. 24	3 turns

All coils on National XR-51 (brass-slug) forms, ½-inch diam., 1 1/16-inch winding space. L_1 and L_2 close-wound with enameled wire; L_3 is plastic-covered hook-up wire wound at cold end of L_2.

mind. It provides for continuously-variable crystal control as described later, but needs no modifications to be used with the crystal combinations given in Table I.

The VXO-II as shown is built on a 8 × 12 × 3-inch chassis. The 6CL6 amplifier was deemed necessary for two reasons — to give additional selectivity for preventing radiation of unwanted mixer products *outside* the bands, and to provide additional output power. When used with transmitters having sufficient tuned stages and gain, the amplifier portion may not be needed.

Only a few precautions are necessary in assembling such a unit:

1) Assemble all parts except the switches.
2) Make crystal leads as short as possible.
3) Attach leads to the crystal sockets, then mount the switches and connect these leads.
4) Set C_2 to about 15 per cent of full capacitance at a point that brings the 20-Mc. bank of crystals to their correct frequencies. Remove the knob and save it for the day the General class license arrives. For Novice operation only the crystal switches will be used to change frequency.
5) Shield, bypass and filter all power leads.

The only nonstandard component is C_2. This is a Hammarlund HFD-140 dual 140-μμf capacitor which has had plates removed until there are 7 rotor and 8 stator plates (approximately 60 μμf) in the control-grid section and 10 rotor and 11 stator plates (80 μμf) in the screen-grid section.

If you make an exact duplicate with the Piezo crystals specified, the trimmers C_1 will adjust the frequencies of the crystals to the exact frequencies in the schedule. If surplus crystals are used, most of which are available in the FT-243 and CR-1/A holders, a larger chassis will be needed and the quartz itself will have to be adjusted to the fre-

TABLE I

Novice operation with 1-kc. channel spacing on 80 and 40 meters. 20 crystals, 100 channels. Mixer output must be tuned to desired difference channel.

Difference Channel	*Crystal Freq. Oscillator A*	*Crystal Freq. Oscillator B*	*Difference Channel*	*Crystal Freq. Oscillator A*	*Crystal Freq. Oscillator B*	*Difference Channel*	*Crystal Freq. Oscillator A*	*Crystal Freq. Oscillator B*
3700.5	16300	20,000.5	3735.5	"	20,005.5	7170.5	12830	20,000.5
3701.5	"	20,001.5	3736.5	"	20,006.5	7171.5	"	20,001.5
3702.5	"	20,002.5	3737.5	"	20,007.5	7172.5	"	20,002.5
3703.5	"	20,003.5	3738.5	"	20,008.5	7173.5	"	20,003.5
3704.5	"	20,004.5	3739.5	"	20,009.5	7174.5	"	20,004.5
3705.5	"	20,005.5	3740.5	16260	20,000.5	7175.5	"	20,005.5
3706.5	"	20,006.5	3741.5	"	20,001.5	7176.5	"	20,006.5
3707.5	"	20,007.5	3742.5	"	20,002.5	7077.5	"	20,007.5
3708.5	"	20,008.5	3743.5	"	20,003.5	7178.5	"	20,008.5
3709.5	"	20,009.5	3744.5	"	20,004.5	7179.5	"	20,009.5
3710.5	16290	20,000.5	3745.5	"	20,005.5	7180.5	12820	20,000.5
3711.5	"	20,001.5	3746.5	"	20,006.5	7181.5	"	20,001.5
3712.5	"	20,002.5	3747.5	"	20,007.5	7182.5	"	20,002.5
3713.5	"	20,003.5	3748.5	"	20,008.5	7183.5	"	20,003.5
3714.5	"	20,004.5	3749.5	"	20,009.5	7184.5	"	20,004.5
3715.5	"	20,005.5	7150.5	12850	20,000.5	7185.5	"	20,005.5
3716.5	"	20,006.5	7051.5	"	20,001.5	7186.5	"	20,006.5
3717.5	"	20,007.5	7152.5	"	20,002.5	7187.5	"	20,007.5
3718.5	"	20,008.5	7153.5	"	20,003.5	7188.5	"	20,008.5
3719.5	"	20,009.5	7154.5	"	20,004.5	7189.5	"	20,009.5
3720.5	16280	20,000.5	7155.5	"	20,005.5	7190.5	12810	20,000.5
3721.5	"	20,001.5	7156.5	"	20,006.5	7191.5	"	20,001.5
3722.5	"	20,002.5	7157.5	"	20,007.5	7192.5	"	20,002.5
3723.5	"	20,003.5	7158.5	"	20,008.5	7193.5	"	20,003.5
3724.5	"	20,004.5	7159.5	"	20,009.5	7194.5	"	20,004.5
3725.5	"	20,005.5	7160.5	12840	20,000.5	7195.2	"	20,005.5
3726.5	"	20,006.5	7161.5	"	20,001.5	7196.5	"	20,006.5
3727.5	"	20,007.5	7162.5	"	20,002.5	7197.5	"	20,007.5
3728.5	"	20,008.5	7163.5	"	20,003.5	7198.5	"	20,008.5
3729.5	"	20,009.5	7164.5	"	20,004.5	7199.5	"	20,009.5
3730.5	16270	20,000.5	7165.5	"	20,005.5			
3731.5	"	20,001.5	7166.5	"	20,006.5			
3732.5	"	20,002.5	7167.5	"	20,007.5			
3733.5	"	20,003.5	7168.5	"	20,008.5			
3734.5	"	20,004.5	7169.5	"	20,009.5			

quencies indicated when following the suggested schedule. Adequate output for a Novice band will be available with the mixer coils tuned to the center frequencies of the respective bands of operation. For a "General" band, stagger tuning will be necessary. Experimenting with turns may be required for full output. There are at least 1½ watts available with 300 volts on the plate of the amplifier. This is adequate power to drive most crystal oscillators or buffers.

Continuous Coverage

Now see how the VXO-II solves the advanced amateur's problem by covering *every* frequency in the band instead of taking them in discrete steps. In addition, see how to convert from Novice to General operation merely by adding the knob you have been saving and changing crystals. All things seem possible through heterodyning.

Heterodyning permits (1) using high-frequency crystals capable of large frequency swings and no sacrifice of stability from the ham viewpoint; (2) direct output in the desired band without multipliers; (3) decade switching and tuning. (Note: S_1 selects the nearest 100 kc., S_2 selects the nearest 10 kc., and C_2 tunes to any frequency in between the 10-kc. steps); (4) excellent resetability; (5) extreme vernier tuning with almost instantaneous band coverage; (6) 45-second warm up; (7) high stability (±5 cycles on 7 Mc. during the first hour after the 45-second warm up.)

Hams have known for years how to shunt a variable capacitor across a crystal to shift its frequency a small amount without having it fail or become erratic.

The permissible shift increases with frequency. Fundamental crystals permit acceptable swings. Overtone crystals have such high *Q*s that they are comparatively little affected. A coil in series with the crystal, as used in the VXO-I,[1] can increase the tuning range almost indefinitely but the greater the swing the poorer the stability, until finally the result is no better than with any other variable-frequency oscillator.

Oscillator *B* (right-hand knob in the photograph) covers the range from 20,000 to 20,100 kc. by switching 10 crystals in steps of 10 kc. Capacitor C_2 (center knob) "tunes" the crystal in the

circuit over the 10-kc. increment, with 500 to 800 cycles overlap at each end. The ten crystals thus provide all the frequencies in the 100-kc. range.

Oscillator *A* (left knob) provides fixed crystal-controlled frequencies at 100-kc. intervals which, when mixed with the 20,000–20,100 kc. in oscillator *B*, produce different frequencies as follows:

Oscillator B 20.0 to 20.1 Mc. *Minus Frequencies Below in Oscillator* A	*Equals Frequency Range*
16.5 Mc.	3500–3600
16.4	3600–3700
16.3	3700–3800
16.2	3800–3900
16.1	3900–4000
13.0	7000–7100
12.9	7100–7200
12.8	7200–7300
6.0	14,000–14,100
5.9	14,100–14,200
5.8	14,200–14,300

At this point oscillator *A* ran out of switch positions, but 12-position switches are obtainable. Three ham bands were included here merely to show how versatile the technique can be. It also points up how nice it is to have a knob that always tunes the same number of kilocycles irrespective of the band used, and without having to multiply by 2, 4, 6, or 8. Nevertheless, most hams already have transmitters with multipliers and thus will be interested only in the 3.5- to 4 Mc. range. The other switch and socket positions can be used for special out-of-band net frequencies like MARS.

The capacitors C_1 are used to trim the oscillator *A* crystals to exact multiples of 100 kc. No trimmers are used in oscillator *B* because every bit of circuit capacitance available is needed to provide the tuning range. Also, no two crystals provide exactly the same frequency change for a given capacitance change, so the trimmers would only aggravate this condition. This lack of uniformity in tuning the 10-kc. steps is the only weakness in this arrangement. It could be solved by methods too expensive to incorporate here.

Any type of good crystal can be used in oscillator *A*, but only crystals designed for oscillator *B* will give the required over-10-kc. swing. Overtone crystals will not shift enough because of their extremely high *Q*s. Crystals with less than 10-kc. swing can be used if enough of them are included to cover 100 kc. As an alternative, 10 crystals in oscillator *A* at 50-kc. intervals mixed with the 10 crystals in oscillator *B* that swing 5 kc. would work just as well for 3.5 Mc.

"Keep crystal leads as short as possible in oscillator *B*" is the only special warning on the wiring. The tube shields are an integral part of the alignment — be sure they are in place when making adjustments.

The VXO-II has a minimum output of 1 watt into 52 ohms on all frequencies, with 1½ watts on 80 and 40.

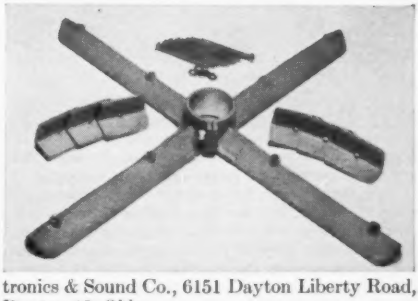
Now some words of warning!

All frequencies used in the schedules have been chosen so that their fundamentals and harmonics fall *outside* the ham bands. This is nice for brother hams but the FCC doesn't like harmonics to fall on other services either. The 6CL6 amplifier was added to the original model in order to reduce the strength of out-of-band harmonics to a minimum, but an on-the-air test is the best insurance. The rig works fine here but play it safe. Key clicks, if apparent, must be treated as with any other rig. Plate voltage to the oscillators should be regulated, although the rig is pretty insensitive to voltage changes. QST

• New Apparatus

Cesco Quad Mount

THE Cesco Quad Mount offers a solution to the problem of making a solid joint between the radial supports and the boom in quad antennas. It consists of a cast-aluminum alloy clamp hub and 4-way spider, as shown in the photograph. The quad arms, not supplied with the mount, are clamped to the spider by V-section over-clamps which are furnished with the mount. Necessary hardware for assembling the unit is included. Arms for the quad can be obtained from the manufacturer or can be homemade of bamboo or Fiberglas. The inside diameter of the hub is 2 inches; the spider arms are about 9 inches long and 1½ inches wide. The Quad Mount kit weighs about 2 pounds and is made by Continental Electronics & Sound Co., 6151 Dayton Liberty Road, Dayton 18, Ohio.



• Recent Equipment —

Eico Model 720 90-Watt C.W. Transmitter

THE Eico 90-watt transmitter, available in either kit or wired form, is a c.w. transmitter covering the amateur bands from 80 through 10 meters. It is capable of 90 watts input on c.w. and, when used with a separate modulator, of 65 watts input on a.m.

The 720 transmitter has a modern low-slung look and probably would fit into a stylish living room without objections from the XYL. The panel is light gray with a copper-tone border and is surrounded by a black wrap-around cabinet case. Large black knobs add to its professional appearance. The cabinet, which is completely sealed for TVI protection, measures 15 inches wide, 6 inches high and 9 inches deep; the entire transmitter weighs about 27 pounds.

Incorporating five tubes, the transmitter begins with a 6CL6 employed as an electron-coupled Colpitts crystal oscillator. An external v.f.o. may be used with the transmitter and can be connected to the 6CL6 oscillator grid by a rear apron switch. Eighty-meter crystals (or v.f.o.) are used for 80- and 40-meter operation and 40-meter crystals are used for 20, 15, and 10 meters. The oscillator plate circuit is self-resonant on 40 meters. On 80 meters the tank-circuit inductance acts as a choke; sufficient energy is obtained from the oscillator on 80 meters to drive the buffer without any tuned circuits.

A 6AQ5 is used as a buffer-multiplier following the oscillator. It is operated as a straight amplifier on 80 and 40 meters and as a multiplier on 20, 15 and 10 meters. An interesting feature here is the pi-network interstage coupling circuit (shown in Fig. 1) which insures attenuation of unwanted harmonics before the signal is applied to the final amplifier grid. The variable capacitor C_1 is the tuning control. For simplification, Fig. 1 shows only one inductance (L_1), but separate coils are used for each band. These are switched along with the final tank-circuit inductance by means of the front-panel band switch. The 68-$\mu\mu$f. capacitor connected from the r.f. amplifier grid to ground helps stabilize the r.f. amplifier, in addition to attenuating any harmonics that get through L_1. The 6AQ5 screen voltage is controlled by a front-panel potentiometer, to allow adjustment of the excitation to the final amplifier.

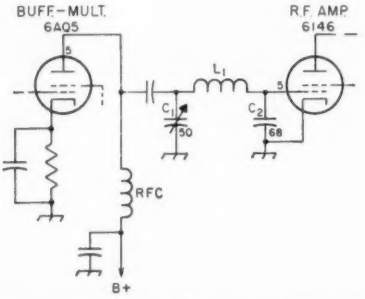
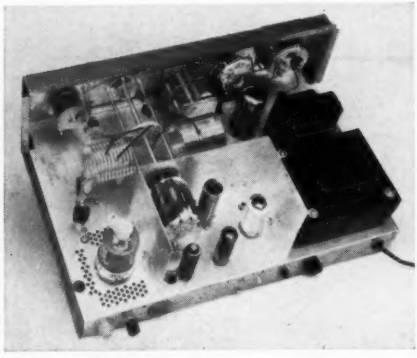


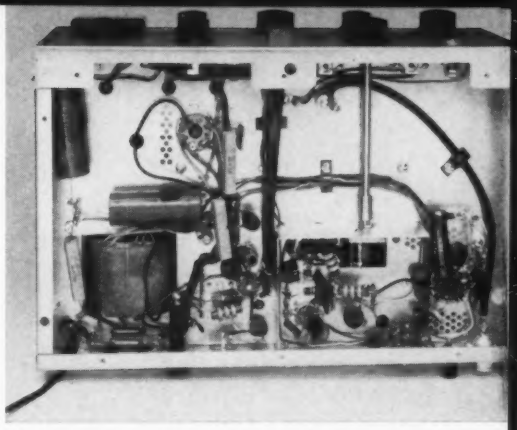
Fig. 1—Simplified diagram of the pi-network grid circuit of the Eico 90-watt transmitter. Switching circuits are not shown. Capacitances are in $\mu\mu$f. Variable capacitor C_1 is the grid tuning control. Separate coils (L_1) are switched into the circuit for each band.



Top view of the Model 720 transmitter also shows the rear apron components. The power supply is located at the right, the oscillator, buffer-multiplier and clamp circuit are in the center, and the final amplifier is to the left. Front-panel components visible in the photograph include, from left to right, amplifier plate tuning capacitor, 3-deck band switch, antenna loading capacitor, function switch and shielded meter. The large air inductors are in the amplifier output circuit.

The 6146 final amplifier is operated Class C as a straight-through amplifier on all bands. A pi-network tank circuit matches the final amplifier to various loads between 50 and 1000 ohms.

Also included in the 720 transmitter circuit is a 6AQ5 clamp tube. This circuit will hold the amplifier plate current to a safe value if grid drive is lost for any reason. The transmitter is keyed by opening and closing the oscillator and final-amplifier cathode circuits, and the 6AQ5 clamp tube holds the amplifier screen voltage at a low value when the key is open. Thus the internal resistance of the amplifier tube is very high and the voltage at the key terminals is only about 12 volts with the key up. Also, the 6AQ5 screen is connected to the screen of the 6CL6 oscillator as shown in Fig. 2; this provides a measure of screen-voltage regulation for the 6CL6 to compensate for the fluctuations that



The shield at the lower right partially surrounds the components of the buffer-multiplier, clamp-tube and final-amplifier circuits. The shaft running from the panel through this shield is the amplifier grid tuning control. The Twin-Lead to the left of the shaft connects the panel crystal socket to the oscillator grid terminal. Power-supply filter capacitors and components are grouped at the left. The a.c. line filter for TVI reduction is in the lower left corner of the photograph.

otherwise might occur during keying. By proper choice of values for the two resistors the current through R_1, and thus the voltage at the 6CL6 screen, can be maintained substantially constant whether the key is open or closed.

A husky 600-volt well-filtered supply powers the transmitter. An octal socket mounted on the rear of the chassis provides connections for an external modulator. A jumper is normally used across these connections for c.w. operation. Also supplied at the octal socket are 6.3 volts a.c. and 117 volts a.c. The 117 volts is supplied only when the front-panel function switch is in the XMIT position. A line filter is installed at the power input terminals for TVI protection.

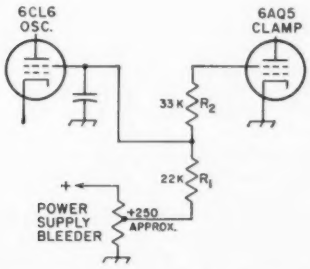


Fig. 2—Screen-supply circuit for the 6AQ5 clamp tube and 6CL6 oscillator. The voltage divider formed by R_1 and R_2 holds the voltage at the 6CL6 screen at approximately the same value whether the key is open or closed.

The function switch controls the a.c. input voltage, center-tap grounding of the high voltage winding of the power transformer (plate voltage on and off), pilot lamps for the stand-by and transmit indicators, and the screen circuit of the 6146. When the function switch is in the TUNE position, the screen of the 6146 is grounded and the plate current is reduced to a safe value while the amplifier grid (buffer plate) circuit is being tuned.

Included among the front-panel controls is a three-position meter switch for selecting amplifier grid current and amplifier cathode current, with a center "off" position. The meter has a "Novice limit" calibration which indicates approximately 75 watts input. The grid-drive control mentioned earlier adjusts the excitation to the final amplifier, and an antenna loading control allows matching the final amplifier to various antenna load impedances. A one-knob band-selector system permits choice of band, and a plate tuning control tunes the output pi network to resonance. The buffer-multiplier plate tank is resonated by the grid tuning control. Also included on the front panel are the key jack, crystal socket, and jewel indicators for "stand-by" and "transmit." Rear-apron components include the r.f. output connector, ground lug, auxiliary modulator and power take-off connector, v.f.o. jack, v.f.o.-crystal switch, fuse and line cord.

Power consumption of the transmitter is about 175 watts. The instruction manual includes a trouble-shooting chart, voltage and resistance chart, operating instructions and other useful information about the unit. The Electronic Instrument Co., Inc., Northern Blvd., L. I. City, New York, manufactures it. — *E. L. C.*

Geloso Model G 209-R Receiver

ALTHOUGH Geloso may be a new name to many American readers, it is well known to overseas amateurs; Geloso, of Milano, Italy, manufactures many amateur components, along with other products such as tape recorders and test equipment. The G 209-R is an amateur-band receiver covering all bands from 80 to 10 meters and, in addition, tunes the 11-meter band. Incorporating 12 tubes, it uses double conversion and has separate detector and a.v.c. channels for s.s.b. and a.m. reception. The receiver has all the usual features of standard communications receiver design plus some extras not usually seen in American models in the comparable price range.

The block diagram in Fig. 1 shows the various tube functions and general line-up of the receiver. The first three tubes — r.f. amplifier, first mixer and local oscillator-buffer — and their circuitry are combined in a mechanically separate unit (Geloso No. N.2618-A) as are the second mixer and the 12AU7 crystal oscillator (No. N.2608). These two units, incidentally, are available individually.

A signal arriving from the antenna is first

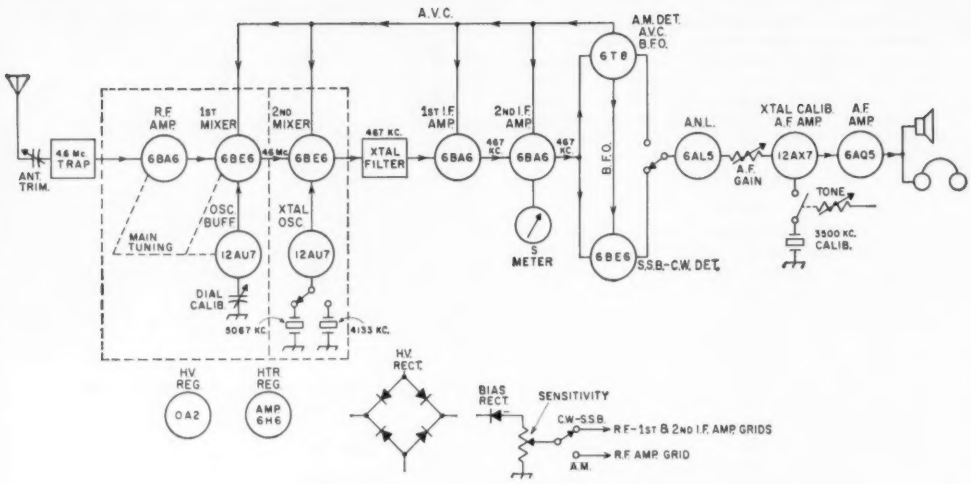


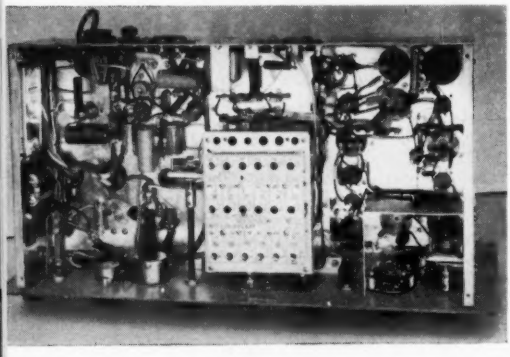
Fig. 1—Block diagram of the Geloso G 209-R receiver.

amplified in the 6BA6 r.f. stage. An antenna trimmer, controllable from the front panel, resonates the input circuit. Next, the signal goes to the 6BE6 first mixer where it is combined with the local-oscillator signal for conversion to the first i.f. of 4.6 Mc. Outside signals on this frequency are prevented from being fed through by a parallel-tuned 4.6-Mc. trap in the receiver's input circuit. One triode of the 12AU7 local oscillator in this section is the tunable oscillator, and its frequency is controlled by the main tuning capacitor. The second triode is a cathode-follower buffer stage, for isolating the mixer from the local oscillator to insure stable operation. More details on this portion of the circuit later.

A single-control capacitor gang tunes the r.f., first mixer and local oscillator. The dial drive connected to this circuit has a 46 to 1 step-down ratio. The dial knob seems small when compared with the average American receiver knob and responds to a lighter touch. Attached to it is a small crank for making rapid sweeps over the tuning range. Accuracy of frequency calibration is rated to be ±10 kc. on the 80-, 40-, and 20-meter bands and ±20 kc. on the 15-, 11-, and 10-meter bands. The dial, which is illuminated, is calibrated in frequency and also has a logging scale. A small variable capacitor, adjustable from the front panel, is connected in parallel with the local-oscillator tuned circuit to permit recalibration of the lower band ends.

Without further amplification, the 4.6-Mc. signal from the first mixer is routed to the grid of the 6BE6 second mixer. Here it is converted to the second i.f. of 467 kc. A 5.067- or 4.133-Mc. signal from a crystal-controlled oscillator provides the beating signal for the second mixer. These two oscillator frequencies provide a choice of upper- or lower-sideband reception, and either can be selected from the front panel.

After leaving the second mixer, the 467-kc. signal goes through a conventional crystal-filter



The labeling on the underside of the Geloso receiver (you probably won't see it in the reproduction) looks like the menu for a pizza house: Transformatore, condensatore, resistenza! The integral r.f., first-mixer and local oscillator-buffer section is visible in the center foreground. All adjustment points in this section are identified by number or letter markings. Most of the trimmers are miniature air-padder capacitors. A special compartment in the lower right corner houses the crystal filter components; the variable capacitor is the crystal phasing control. Power- and bias-supply components are mounted on the chassis wall at the left side of the photograph. The full-wave selenium bridge rectifier is the bright rectangular object just above the filter capacitors. The shielded calibration control is on the front panel just to the left of the r.f. assembly.

circuit which has five steps of selectivity. Following the crystal filter are two 6BA6 i.f. amplifiers. The S meter is in the plate circuit of the second i.f. amplifier.

In the 6T8 tube following the second i.f. amplifier one diode acts as a detector for a.m. signals and the other rectifies the signal to obtain a voltage for the a.v.c. system. A 6BE6 product detector is used for s.s.b. and c.w. reception. When the front-panel mode switch is turned to CW-SSB, the a.m. detector is switched out of the circuit. The triode section of the 6T8 is used as an adjustable 467-kc. beat-frequency oscillator, with its output capacitively coupled to the grid of the product detector.

A 6AL5 series-type noise limiter follows the detectors. Clipping both sides of the audio, the limiter is effective for a.m., c.w. and s.s.b. reception, and has a self-adjusting feature which enables it to accommodate itself automatically to different signal levels through being tied in with the a.v.c. system. A panel control permits adjustment of the clipping level. Two stages of audio amplification provide sufficient gain (2.5 watts output) to power a speaker or headphones. The audio output circuit is tapped at 3.2 and 500 ohms.

One section of the 12AX7 audio amplifier tube is used as a 3.5-Mc. crystal oscillator for band-edge checking. Harmonics from the oscillator are usable on all bands covered by the receiver. The oscillator is controlled by a switch common to the tone control shaft.

For sensitivity (manual gain) control the Geloso receiver uses a negative d.c. supply and applies it through a potentiometer as bias to the grids of several tubes. During reception of s.s.b. or c.w. signals the bias voltage is applied to the r.f. and first and second i.f. grids. On a.m., it is applied only to the r.f. stage. Working along with the sensitivity circuit is the a.v.c. system. Unlike most American receivers, the G 209-R has a.v.c. applied to the first mixer. This is usually considered undesirable practice because of the pulling effect that the a.v.c. has on the local oscillator frequency. However, Geloso has overcome this problem, as mentioned earlier, by using a buffer stage between the local oscillator and first mixer. During a.m. reception, a.v.c. bias is applied along with the bias from the sensitivity circuit as shown in the block diagram. On c.w.-s.s.b., a.v.c. voltage is applied only when it is greater than the bias level set by the sensitivity control.

A look at the power-supply section of the G 209-R shows no sign of the vacuum-tube high-voltage rectifier usually found in receivers of this class. Instead, Geloso uses a selenium bridge rectifier for the high-voltage and bias power supplies. This type of rectifier has a big advantage over the vacuum tube as far as heat reduction goes. A VR tube stabilizes the plate voltage of the b.f.o., local oscillator and the product detector. An Amperite 6H6 regulates the heater current of the 12AU7 h.f. oscillator and the 6T8 b.f.o. tube. The power transformer is equipped with a tapped primary winding so that the receiver can be powered by a wide range of line voltages — 110, 125, 140, 160 and 220 volts. This feature, along with the regulated heater and high-voltage circuits, makes the receiver look attractive for Field Day use or for DXpeditions, where poor line voltage regulation is usually a problem. Power consumption of the receiver is about 90 watts.

Rear apron connections are visible in this top view of the G 209-R. From left to right: the line-voltage adjustment switch, fuse, connection for stand-by remote control (top), a.f. output terminals (3.2 and 500 ohms), antenna input for coaxial cable (top), and antenna input for balanced line. Visible on the front panel are the mode switch and noise limiter (left), dial pulley (center) and S meter (right). Power-supply components are grouped along the left edge of the chassis, r.f. and mixer circuits are in the center, and i.f. components and the S-meter zero adjustment are at the right. Crystals for the second-mixer crystal oscillator are mounted on top of the second mixer-crystal oscillator subassembly. The crystal next to the S meter is used in the i.f. crystal filter. A 3.5-Mc. calibration crystal is in the lower left foreground.

All necessary plugs, fuses and cables are sent along with the receiver. A very complete 65-page instruction book is also included. Twenty-one pages of this book are devoted to the G 209-R receiver and the remaining pages contain information on other Geloso equipment.

The G 209-R is 20 inches wide, 10 inches high and 10¼ inches deep. Front panel dimensions are 19 by 8¾ inches. Geloso products are available in the United States from American Geloso Electronics, Inc., 251 Park Ave. South, New York 10, N. Y. — *E. L. C.* QST

Strays

As a result of the overwhelming success of the Transistor Workshop Lecture Series held in April and May (see the announcement on page 10 of February 1959 *QST*), the six complete sets of lecture notes on the use and applications of transistors are now available in one bound volume for $5.00 postpaid through the office of the Boston Section, Institute of Radio Engineers, 73 Tremont St., Boston, Mass.

Col. Guy M. Blencoe, I1EZZ/M1, and his 10-meter beam that put out world-wide signals during his DXpedition to San Marino. The station was set up behind the castle in the center of this photo.

BY COLONEL GUY M. BLENCOE*, DL4GX

San Marino Calling

HAVE YOU ever dreamed of *being* DX, not just calling DX? If so, read on, since this might be of interest to you.

After several months of working I1DFC in Verona (the city of Romeo and Juliet), the possibility of a DXpedition came to mind. A quick check of geography indicated that the most likely possibility was the tiny Republic of San Marino, only 175 miles southeast of Verona. One of the many advantages of military service is the occasional assignment to exotic spots from which ham radio is rarely operated, or perhaps one can find a place where the feet of radio amateurs have *never* trod. In the period of my military service, it has been my privilege and good fortune to be one of the first Americans to operate amateur radio in three countries — Korea in 1947 and 1948 as J8AAA, later HL1AA; Italy in 1958 as I1DFC; and San Marino from 3 to 6 March 1959 as I1EZZ/M1.

San Marino is the smallest republic in the world. It is a country of but 38 square miles in area. In fact, when one stands on the high ramparts of the old feudal walls, he can see far beyond its boundaries on all sides. Looking east on a clear morning, one can see a gorgeous sunrise on the beautiful Adriatic Sea. Looking straight down from such a point, there is a sheer drop of nearly 2000 feet. The entire population of this picturesque republic is 14,000. In the tourist season there are nearly as many visitors as local populace.

Licensing Procedure

A letter was dispatched to the Minister of Telecommunications in August 1958. (For you hams who are also philatelists, you would have loved the beautiful and popular stamps on the letters I received from this little storybook republic.) In due time, a reply indicated their cooperation, provided that approval was received from the Italian Minister of Telecommunications. Although San Marino is a republic, its geographical position entirely within the boundaries of Italy makes for a rather unusual degree of close administrative cooperation with Italy. After several communications on the subject of amateur radio operation in San Marino by a U. S. citizen, a telegram of authority was received the last week of February 1959. Instead of using I1DFC/M1, a new call was assigned — I1EZZ/M1. It was actually a transfer of authority for the operation of I1DFC specifically for the period of the DXpedition. With military leave approved, plans got under way for departure set for 3 March. A check list was prepared to insure that operations would not be affected adversely by any omission. This list included items which might be forgotten, such as: extra fuses, tools for maintenance, coax relay and adapters, headphones, guy rope and guy stakes, extra length extension cords, variable ratio transformer to take care of voltage variation, compass, friction tape, amateur license, soldering iron and solder, electric drill and bits, plenty of haywire in case anything goes wrong, many sharpened pencils and of course, Nescafe, crackers, cheese, beans and Vienna sausages. Unfortunately, poor radio propagation conditions the last days in February prevented getting the

Mario, licensed as M1B in San Marino, drops in for a chat as I1EZZ/M1 works with the KWM-1 on 10 and 20 meters.

* Ex: 9CAV, W9ESM, W2ESM, W4HVU, J8AAA, HL1AA, DL4LU and I1DFC; Deputy Signal Officer, Seventh U. S. Army, APO 46, New York, New York.

final plans disseminated properly in order that all the DX hounds could be alerted.

With 10 meters as hot as it has been, operation on that band was decided to be a requirement, 20 meters being a good bet for periods when the m.u.f. had moved down. 15 had to be eliminated because of lack of space for carrying more gear on and in my car. Furthermore, between the hours that 10 and 20 would be open, most of the day was covered. Aluminum tubing of all sizes and from many sources, was thrown together into a three-element beam with a "slide trombone" type of gamma match. Wire was measured carefully for a dipole on 20. A Collins KWM-1 was the choice for the transmitter-receiver. Since a Collins DX Adapter was not available, a military version of the 75A-3 was also chosen to permit listening in the U. S. portion of 20, while transmitting in the DX band.

A ski rack was mounted on the roof of the car. It provided an excellent means of carrying the aluminum tubing for the beam and the supporting mast. At 1040 GMT, 3 March, a one-man DXxpedition left Verona, Italy and got under way. The 175 miles to the Republic of San Marino were covered in 4½ hours.

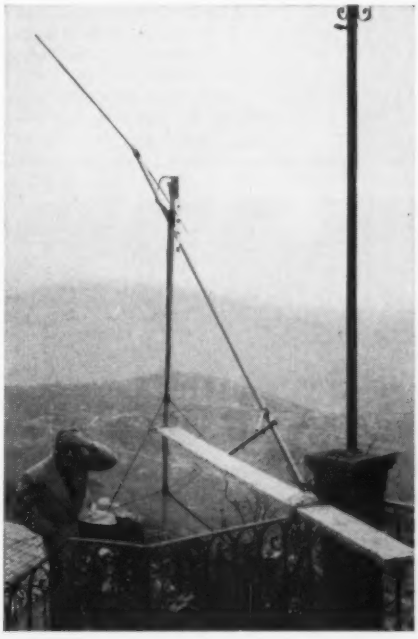
Getting Set Up

As one approaches San Marino from the Italian city of Rimini on the Adriatic, the rocky mountain empire rises almost vertically from the flat plain. The view is so unusual that it was chosen to be the theme on the special QSL card made up for the expedition. Thirty minutes of winding road brought me to the city of San Marino at an elevation of one half mile. The streets are so steep and narrow that one often has to park in designated areas and walk the last few hundred feet to his destination. I was met at the door of the Hotel Titano, where my reservation had been made, by the owner, Mr. Giuseppe Gozi. In my broken Italian, I queried him as to whether my room would be feasible for the proposed radio operation. He answered in flawless English that it would and also gave me a choice of rooms. I chose one fairly near the roof terrace and between two locations where a 10-meter beam and a 20-meter dipole could be installed. Three willing, and really quite charming, bell girls carried the precious KWM-1 and associated gear to the room. The house electrician helped me get the home-made beam erected. Never could a hotel have provided more efficient service for such unusual requirements. Of course, it should be pointed out that I was an off-season guest; in fact, I was the only American there for two days. Mr. Gozi called Mario, of M1B fame, and had him in the hotel in a matter of minutes. He, in turn, pointed out that I would have to get permission from the Chief of Police. A one-minute walk brought us to the man in question and the approval was granted. Mario stated that he had not been on the air for well over a year, and of course had never been on s.s.b. He has had equipment troubles, but hopes to get back on the air sometime yet this year. If so, San Marino will be available again as a rare country for the DX hounds.

Upon my return from the Police Station, I set the "slide trombone" type Gamma match [1] by guesstimate, based upon previous experience with this simple and effective feed system. After a quick run down the stairs to the operating room, I connected the RG-8/U to the KWM-1 and took a quick check across the band. It was really hot! I had thought I would check the s.w.r. and then readjust the match, but lo and behold, it was 1.3 to 1.0, not too bad for a first attempt. Anyway, it was now 1830 local time and too dark outside to see whether I was on the roof, the terrace, or among high tension wires nearby. I wanted to operate around 28.65 Mc., since I had managed to get information out to a few hams that I'd try to be on that frequency if all went well on the DXpedition. After listening for a few minutes to W3LIT and W8LIO chew the rag right on 28.65 Mc., I couldn't stand it any longer. I gave a quick "Break, break. Are you fellows reading I1EZZ/M1 in the Republic of San Marino?" To my surprise, and I believe to their amazement, the first s.s.b. QSO from San Marino was established! Bob at W3LIT gave me a 5 by 9, and Jack at W8LIO gave a similar report. The decision as to further re-

(Continued on page 160)

[1] July 1957, *QST*, p. 30.



Mike, W2NVR, is dismayed to see wind damage to the 10-meter beam. But the beam was repaired with baling wire for another 150 contacts.

Dialing the Code

A Method for the Physically Handicapped

BY TERREL N. TATUM,* W6LKJ

I AM twenty years old and have cerebral palsy which I have had since birth. I go to the Glendale Home School for handicapped children where I am a senior in high school and will graduate in June. Cerebral palsy, sometimes referred to as spastic paralysis, is due to an injury or deterioration of tissue of the central nervous system. Cerebral palsy, then, is a term covering all kinds of impairment of muscular control because of damage to the brain. In my case, my hand coordination, speech, and walking are affected.

In 1954 my parents gave me a short-wave radio for Christmas, and I soon became very interested in amateur radio. At that time, with my handicap, I couldn't see how I could ever become a licensed ham operator, but I had the determination and wouldn't give up.

I soon became a short-wave listener, spending many hours listening to hams all over the world. I sent out many s.w.l. cards and received over two hundred replies.

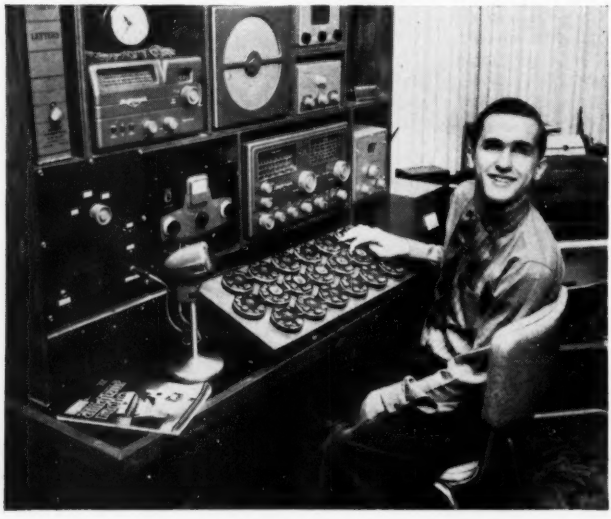
During Christmas vacation in 1955 I heard a Mark Hurwitt, K6CQO, from Burbank handling messages for other hams. I immediately contacted him by telephone and asked him to send a message to my grandparents in Iowa. This was the beginning of a friendship with a man whom I will never forget. We had many telephone conversations during the following months. He kept encouraging me to learn the code and theory so I could get on the air. At this time, I think he wondered whether I would ever be able to make it. I was determined to do it. With the help of neighbors, and friends, I collected newspapers and sold cards and stationery of all kinds to earn enough money for a better receiver.

In January of 1957 Mark started coming to my home at least one night a week, helping me with code and theory. When Mark wasn't here helping me, my father worked right along with me. By April I was ready to take the test for my novice license. Right after I had taken the test, I bought a Viking Adventurer transmitter. Now my problem was, if I passed the test, how to be able to send code so that a person not acquainted with my style of sending could copy it, as I don't have good coordination in my hands. One night when Mark was using his telephone and dialing the number, this thought came to his mind, "Why not use telephone dials for Terry to send code?" So, Mark and my dad fixed up nineteen telephone dials. The dials were revamped and relays added so that on each dial a series of characters could be sent. It is possible to send up to twelve words per minute. I copy the code on an electric typewriter which I can use quite easily. I hope that sometime in the future we will be able to find a way to convert an electric typewriter to send code so that I can obtain a greater speed in sending.

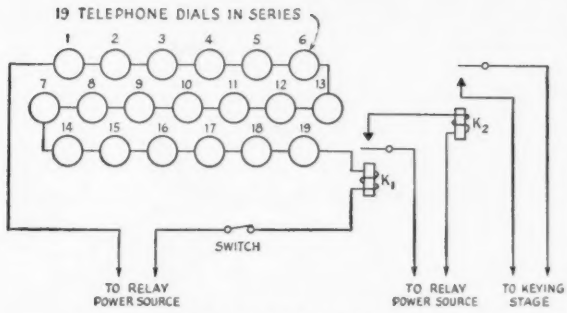
In June, 1957, I received my novice license with my call letters WN6LKJ. I was very happy. During the following year I was on the air every chance I could get and enjoying every minute of it.

In April 1958 Mark wrote to the FCC asking

* 1451 Raymond Avenue, Glendale 1, California



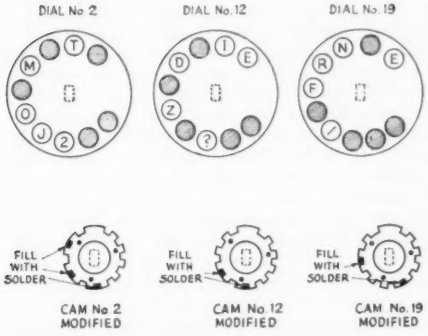
Terry Tatum, W6LKJ, and the nineteen telephone dials with which he is able to dial the code at about 12 w.p.m. Look for him on 40-meter c.w.



Use low voltage relay at "K_1" as danger of shock is great due to method of insulation of dial, dial action and possible failure

This diagram shows how the nineteen telephone dials are hooked into the keying circuit. As noted on the diagram, a low-voltage relay is used at K_1 because of insulation problems in the dial mechanism. The low-voltage relay K_1 in Terry's station will not handle the current in the keyed stage of the transmitter, and so it is used to "key" a second relay which in turn keys the transmitter.

Study of the circuit shows that the code characters are formed when a contact rides up on the cam. This keys the normally closed relay K_1, by opening the circuit so that it in turn makes the circuit containing relay K_2. Since current is normally flowing through the dial mechanism when nothing is being sent, the switch opens the circuit when the station is not in use.



K6CQO and Terry's dad reworked the dial mechanism as shown in this drawing so that spinning the various dials will produce certain code characters. Several letters can be made on more than one dial.

them if I could get a conditional license so he could give me the test here in my home. The request was granted and in May I took the test. I received my conditional license on June 26, 1958.

Mark suggested that I might be able to earn some money by selling magazine subscriptions by mail, so in July, 1958, I started a magazine subscription service. I hope to make part of my living in this way. I am also trying to find some type of work that I can do in either radio or television.

New Year's night, 1959, I went on phone for the first time. I find it is a little harder for me, but with practice and patience I am sure my speech will improve. I am not giving up c.w., however.

At night I can be found on 40 meters c.w. between 7050 and 7100 kc. Late afternoon I will be on phone on either 10 or 40 meters. I would like a QSO with anyone. QST

Strays

"The bedroom is the last place I would ever put the 'rig' but . . . that's the last place available and that's where it is!" W4IEN, Jim Brigman of Norcross, Ga., has a growing family and few bedrooms. This picture shows how he built a console for his rig that looks like another piece of furniture when it is closed.

The console is ready for use quickly, has plenty of room for equipment, operating and extra storage. And it can be used for more than one type of transmitter and receiver.

The receiver deck holds almost any type receiver, speaker, beam control and telephone. The open shelf below handles storage for logs, key scratch pads, pencils and "assorted junk."

The mike sits inside the receiver deck when not in use. The two openings on the right can take almost any two pieces of commercial transmitting equipment or cabinets up to 20 inches wide.

Two drawers on the right hold a large assortment of parts and tools while the two doors at left open into more storage.

The rear of the console is open for ventilation and the top opens all the way across with a piano hinge for additional airing. All antennas are coax fed and the line goes through holes bored at the rear of the console. The whole unit is on casters and can be moved easily to work on the back side.

Happenings of the Month

Board Meeting Highlights and Minutes
50/144 Mc. C.W. Question Reopened
Examination Schedule
RACES Frequencies Expanded

BOARD MEETING HIGHLIGHTS

The Board of Directors of The American Radio Relay League, Inc., met at Hartford, Connecticut on May 15, 1959, and in sessions which lasted until late in the evening examined the affairs of the League and made a number of policy decisions for our future course.

The Board discussed in considerable detail League plans for representation of the amateur radio service, as part of official Government delegations, at the forthcoming international telecommunications conference in Geneva commencing in August. A fund of $25,000 was made available to cover expenses of ARRL participation. General Manager A. L. Budlong, W1BUD, and Assistant General Manager John Huntoon, W1LVQ, will represent the League as members of the U. S. delegation, and Canadian Director Alex Reid, VE2BE, will attend as a member of the official Canadian delegation. Also present for the League, traveling at his own expense, will be ARRL General Counsel Paul M. Segal. League President Goodwin L. Dosland, WØTSN, and Technical Director George Grammer, W1DF, will be available to attend as required.

The By-Laws were revised to set the annual League membership dues at $5.00 per year in the U. S. and possessions and $5.25 in Canada, both effective August 1, 1959. The Board noted that it had been possible to hold the old $4 rate for more than eleven years before a rise was required to keep the League in a sound financial condition.

The Board appointed three new members of the Executive Committee: Central Division Director John G. Doyle, W9GPI; Hudson Division Director Morton B. Kahn, W2KR, and New England Division Director Milton E. Chaffee, W1EFW. Communications Manager F. E. Handy, W1BDI, and Treasurer David H. Houghton were continued as Executive Committee members but without vote. In further amendment of the Articles of Association, the Board provided that a Vice-Director may represent his division at any Board meeting which the Director is unable to attend.

The studies of the Housing Committee were ordered continued, looking toward the possible eventual selection of new Headquarters office facilities. The Board asked its Planning Committee to examine the possibilities of greater public relations efforts in the field of television programs.

An ARRL national convention for 1962 was approved by the Board, to be held under the sponsorship of the Affiliated Council of Amateur Radio Clubs, Inc., of Portland, Oregon. The Board once again commended the Field Engineering & Monitoring Bureau of FCC for its cooperation with amateurs during the past year, and similarly expressed its thanks to volunteer field officials of the League for their outstanding performances. A special word of commendation was extended to Director Meyers and the Los Angeles Council of Radio Clubs for their excellent handling of the K6USA installation at the CCIR conference in that city during April.

Formal minutes of the meeting appear at the end of this department.

DOCKET 12444

FCC has now completed its proceeding in Docket 12444 by amending our rules, effective June 10, to provide that Novice and Technician Class licensees may be required to appear for personal examination when, in the Commission's

Richard S. Morse, W1AFZ, is the Army's new Director of Army Research and Development, a position with authority equivalent to that of an assistant secretary of the Army. A ham since 1926, W1AFZ was an active DX'er until other demands on his time blocked contesting. In 1952, for example, he tallied 84,252 points in phone contacts for the leading W1 score and the fourth highest in the W/VE area. A graduate of MIT, he has resigned from the presidency of the company he founded — National Research Corp. in Cambridge, Mass. — to take the government post. W1AFZ, who has served as a scientific advisor to the Army in recent years, will now be responsible for its research and development program which includes exploration of new items and changes in current designs.

The ARRL Board of Directors and League officials during the meeting in Hartford on May 15. Seated, l. to r.: Dakota Director Gowan; West Gulf Director Payne; Delta Director Canfield; Southwestern Director Meyers; Pacific Director Engwicht; First Vice-President Groves; Northwestern Director Roberts; Midwest Director Denniston; Vice-President and Communications Manager Handy; General Counsel Segal; President Dosland; General Manager Budlong; Assistant General Manager Huntoon; Treasurer Houghton; Canadian Director Reid; Vice-President Noble; New England Director Chaffee; Rocky Mountain Director Maer; Great Lakes Director Brabb; Hudson Director Kahn. Standing, l. to r.: Technical Director Grammer; Southwestern Vice-Director Talbott; New England Vice-Director Polo; Great Lakes Vice-Director Cartwright; Southeastern Director Born; Roanoke Director Anderson; Counsel Robert Marmet; Atlantic Director Crossley; Central Director Doyle; Assistant Secretary Williams.

judgment, circumstances so warrant. This amendment does not require, as some amateurs apparently believed, every Novice and Technician to so appear. But in practice a Novice, for example, may be cited for improper station operation a number of times sufficient to raise the question of whether he is really qualified to hold his privileges, and in that case the Commission may want to call him in for an FCC-supervised exam. This same procedure has existed for many years in the case of Conditional Class tickets, and the new amendment simply brings Novice and Technician Classes within the same provisions — i.e., all classes where exams are taken by mail.

RACES EXPANSION APPROVED

At press time FCC has just announced amendment, effective July 1, 1959, of the rules governing the Radio Amateur Civil Emergency Services (RACES) to provide expanded frequency privileges for that service exactly as shown in the appendix published commencing on page 166 of February *QST*. Details next month.

C.W. ON 6 AND 2

The Federal Communications Commission has re-opened the question of whether the lower 100 kc. of the 6- and 2-meter amateur bands should be restricted to A-1 operation. Interested readers will recall that ARRL petitioned the Commission to this end a year ago; that late in 1958 FCC issued an order granting exclusive c.w. bands but placing them at entirely different locations than those requested; and that, responsive to League (and other) requests, the Commission postponed the effective date of its order and agreed to consider arguments for possible re-opening of the original question. These now having been filed (for the text of the League's document, see page 84, May *QST*), FCC has announced that it wants to receive, by August 3, comments for or against the original ARRL proposal to establish 100 kc. segments at the low ends of the 50- and 144-Mc. bands for exclusive A-1 emission. The text of the Commission's order follows:

FEDERAL COMMUNICATIONS COMMISSION

In the Matter of

Amendment of Section 12.111 of the Commission's Rules, Amateur Radio Service, to provide that only A1 emission may be used in the lower 100 kc. of the 50 and 144 Mc. amateur band. } Docket No. 12485

FURTHER REPORT AND ORDER

By the Commission:

1. A Notice of Proposed Rule Making was issued in the above-captioned proceeding on June 11, 1958, proposing establishment of sub-bands within the 50–54 Mc. and 144–148 Mc. amateur bands wherein only amateurs utilizing type A1 emissions [1] would be allowed to operate. It was proposed that these sub-bands should be 50.0 to 50.1 and 144.0 to 144.1 Mc. On December 3, 1958, a Report and Order was issued in this proceeding which stated in part:

> The Commission concludes that the public interest will be served by establishment, as proposed, of 100 kc. segments of the 50–54 Mc. and 144–148 Mc. amateur frequency bands wherein operation may be conducted only if type A1 emission is used. However, the Commission is also led to conclude that the public interest would not be served by utilizing the lower 100 kilocycles of the 50–54 Mc. and 144–148 Mc. band, as proposed, for establishment of such segments . . .
>
> * * * *
>
> In view of all factors involved it is concluded that restriction of the frequency ranges 50.9–51.0 Mc. and 147.9–148.0 Mc. so as to permit operation therein only when type A1 emission is used will be in the public interest.

2. On January 9, 1959, pursuant to requests filed by the American Radio Relay League, Inc., and other interested parties, the Commission issued an Order which postponed until further notice the effective date of the amendments ordered in the above-referred-to Report and Order and extended until March 10, 1959, the time for filing petitions for reopening or reconsideration.

3. A substantial number of petitions seeking reopening of the proceeding for acceptance of additional comments have

[1] Telegraphy without the use of modulating audio frequency.

been filed as have a number of petitions which seek reconsideration by the Commission on the present record.

4. The bulk of petitions seeking reconsideration on the present record allege that the action of the Commission in designating frequency segments of the 50–54 Mc. and 144–148 Mc. bands, other than 50.0 to 50.1 and 144.0 to 144.1 Mc., wherein only type A1 emission will be allowed, denied to interested persons "the right of presenting and having considered relevant, competent, and material evidence having essential and probative value." It is urged by these petitioners that the Commission's action in designating the frequencies 50.9 to 51.0 Mc. and 147.9 to 148.0 Mc. rather than the frequencies 50.0 to 50.1 Mc. and 144.0 to 144.1 Mc. as "C.W. Subbands" constitutes failure to comply with Section 4(a) of the Administrative Procedure Act. Section 4(a) of the Administrative Procedure Act provides in pertinent part:

> Section 4(a) Notice — General Notice of Proposed Rule Making shall be published in the Federal Register (unless all persons subject thereto are named and either personally served or otherwise have actual notice thereof in accordance with law) and shall include . . . (3) either the terms or substance of the proposed rule *or a description of the subjects and issues involved.* (emphasis added)

The Notice of Proposed Rule Making proposed: first, the establishment of 100 kilocycle sub-bands within the 50–54 Mc and 144–148 Mc. amateur frequency bands wherein only type A1 emission would be allowed; and second, that such sub-bands be composed of frequencies between 50.0 to 50.1 and 144.0 to 144.1 Mc. In describing the second of those proposals the Notice of Proposed Rule Making stated in part:

> Petitioner in justification on its selection of the lower 100 kilocycles of the involved bands for exclusive use of A1 emissions states: "In the case of the 50–54 megacycle band there is technical justification for selection of the low-end for the exclusive cw segment. For example, in F_2 layer work, such as is now going on widely and as the result of the current solar activity peak, and (although not quite to the same extent), sporadic-*E* propagation, the lower the frequency the better the chance of making distant contacts. In the case of the 144 Mc. band, the location of the proposed c.w. segment is not subject to the same technical justification, and our selection of the low-end is purely a matter of consistency with other amateur band sub-allocations.

5. Even a cursory reading of the Notice of Proposed Rule Making reveals that the basic issues in this proceeding were: First, should exclusive "c.w." sub-bands be established within the 50–54 Mc. and 144–148 Mc. bands; and second, if exclusive "c.w." sub-bands should be established in the above-referred-to bands, should the placement of such sub-bands be as proposed by the Commission or at other points within the 50–54 Mc. and 144–148 Mc. bands? It was, therefore, incumbent upon all parties to offer whatever evidence they wished the Commission to consider relative to those issues. The failure of any party or parties to recognize the issues involved in the proceeding can hardly be said to constitute violation of Section 4(a) of the Administrative Procedure Act. Furthermore, as stated by the court in *Logansport Broadcast Corporation* vs. *The United States*, 210 F. 2nd 24:

> Section 4(a) "requires only that the prior notice include 'a description of the subjects involved.' . . . Surely everytime the Commission decided to take account of some additional factor it was not required to start the proceedings all over again. If such were the rule the proceedings might never be terminated."

Accordingly, those petitions which seek reconsideration upon the record presently before the Commission are denied.

6. Petitioners who seek reopening of the record for reception of additional comments allege that evidence will be adduced to show:

(a) "The serious v.h.f. — amateurs who are now requesting a low-end c.w. assignment *are the very ones who have pioneered 50 Mc. and 144 Mc. operation in the past.* The very early work on these bands was done on A3 simply because it was satisfactory for the work being done at that time. However, in order to further advance the state of the art, it has been necessary to resort to the more efficient mode of A1. The opposition to low-end c.w. assignment consists largely of those amateurs who were not involved in the earlier pioneering work on the v.h.f. bands. Thus, assignments of A1 sub-bands at 50.9 and 147.9 Mc. deprive the serious v.h.f. amateurs of the use of portions of the very bands which they explored and opened up for the later use of the more casual operator who has provided only numbers and occupancy."

(b) "Present antenna structures in use on 144 Mc. by serious v.h.f. amateurs are largely Yagi or Yagi-array types, due to the much larger gain that may be obtained for given weight or bulk. The Yagi, however, is severely limited in bandwidth, and use of a c.w. sub-band at 147.9 would require virtual rebuilding of these structures to make them usable at the new frequency."

(c) "A c.w. sub-band assignment of 50.0 rather than 50.9 Mc. would allow the greater exploration of F_2 openings by the more efficient mode of modulation, A1."

(d) "Any attempted use of the 147.9 c.w. sub-band would result in exclusion of the amateur in question from operation on A3 in conjunction with the stations clustered at the low-end, by virtue of the antenna bandwidth problem . . . (Clustering of A3 stations below 144.5 Mc. is evident by simple observation). This situation is contrary to the established practice of initiating a contact on A1 and then using A3 when signal strengths are found to be adequate."

(e) "Those serious v.h.f. operators who desire a low-end A1 assignment, by and large, operate both on A1 and A3. Those who oppose such an allocation largely use A3 only. The low-end A1 proponents are not 'a small minority' of the amateurs who have shown sufficient versatility to utilize the modulation mode most appropriate to the prevailing band condition."

(f) "Assignment of the 50.9 and 147.9 Mc. sub-bands to exclusive A1 use would result in the dispossessing of the net activity presently established there. Little or no (net) activity is presently found in the lowest 100 kilocycles of 50 and 144 Mc. bands."

(g) The restriction of 147.9–148 Mc. to exclusive c.w. operation would have a "Catastrophic effect" on amateur "teletypewriter fixed frequency operation."

7. In view of the fact that evidence of the type petitioners allege will be adduced is, in some cases, not contained in the present evidentiary record, the Commission believes that the proceeding should be reopened for the receipt of additional evidence.[2]

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[2] In connection with the receipt of additional comments, the Commission wishes to point out that the weight accorded particular comments depends solely upon the content thereof. For example, the "ballot" type of comment is of no probative value in determining whether or not the public interest will be served by adoption of a particular rule, and thus, such comments are accorded very little weight in the deliberations of the Commission. On the other hand, comments which clearly set forth sound reasons in support of the position taken must be accorded considerable weight. Thus, the position taken by a small minority of the parties commenting on a given proposal may well prevail if such comments are sound and well reasoned even though a vast majority of the total number of comments filed advocate a different position but do not set forth sound arguments. These facts should be kept in mind by all parties when formulating comments to be filed in this or other Commission proceedings.

8. Accordingly, IT IS ORDERED, That, any interested person may file written data, views or briefs setting forth his comments, either in support of or in opposition to the amendments proposed by the Notice of Proposed Rule Making issued in this proceeding, on or before August 3, 1959. Comments in reply to such data, views or briefs may be filed on or before August 14, 1959. The Commission will consider all properly filed comments prior to taking final action in this matter.

9. In accordance with the provisions of Section 1.54 of the Commission's Rules, an original and fourteen copies of all statements, briefs or comments shall be furnished the Commission.

FEDERAL COMMUNICATIONS COMMISSION

Mary Jane Morris

Secretary

Adopted: April 29, 1959
Released: April 30, 1959

BOARD THANKS VOLUNTEER A.R.R.L. OFFICIALS

In reviewing the work of the League for the past year the ARRL Board of Directors again found that much of our progress is due to the volunteer efforts of elected and appointed officials in the administrative and field organization of our association. By unanimous action the Board has again expressed its sincere thanks to the Vice-Directors, director assistants, SCMs, SECs and QSL Managers — an action which we know all amateurs will heartily endorse.

EXAMINATION SCHEDULE

THE Federal Communications Commission will give Extra and General Class amateur examinations during the second half of 1959 on the following schedule. Remember this list when you need to know when and where examinations will occur. Where exact dates or places are not shown below, information may be obtained, as the date approaches, from the Engineer-in-Charge of the district. *Even stated dates are tentative and should be verified from the Engineer as the date approaches.* No examinations are given on legal holidays. All examinations begin promptly at 9 A.M. except as noted.

Albuquerque, N. M.: October 3, 8 A.M.
Amarillo, Texas: Sometime in September.
Anchorage, Alaska, 53 Federal Bldg.: By appointment.
Atlanta, Georgia, 718 Atlanta National Building, 50 Whitehall St. S. W.: Tuesday and Friday at 8:30 A.M.
Baltimore, Md., 400 McCawley Bldg., 400 E. Lombard St.: Monday and Friday, between 8:30 A.M. and 10 A.M. and by appointment.
Beaumont, Texas, 301 P. O. Bldg.: By appointment.
Birmingham, Ala.: September 2, December 2.
Boise, Idaho: Sometime in October.
Boston, Mass., 1600 Customhouse: Wednesday through Friday 9:00 A.M. to 10 A.M.
Buffalo, N. Y., 328 P. O. Bldg.: First and third Fridays.
Butte, Mont.: Sometime in September.
Charleston, W. Va.: Sometime in September and December.
Chicago, Ill., 826 U. S. Courthouse: Friday.
Cincinnati, Ohio: Sometime in August and November.
Cleveland, Ohio: Sometime in September and December.
Columbus, Ohio: Sometime in July and October.
Corpus Christi, Texas: September 3, December 3.
Dallas, Texas, 401 States General Life Ins. Bldg.; Tuesday.
Davenport, Iowa: Sometime in July and October.
Denver, Colo., 521 New Customhouse: 1st and 2nd Thursdays, 8 A.M.
Des Moines, Iowa: Sometime in September and December.
Detroit, Mich., 1029 Federal Bldg.: Wednesday and Friday.
Fort Wayne, Ind.: Sometime in August and November.
Fresno, Calif.: Sometime in September and December.
Grand Rapids, Mich.: Sometime in July and October.
Hartford, Conn.: September 5.
Hilo, T. H.: October 6.
Honolulu, T. H., 502 Federal Bldg.: Monday through Friday.
Houston, Texas, 324 U. S. Appraisers Bldg.: Tuesday and Friday.
Indianapolis, Ind.: Sometime in August and November.
Jackson, Miss.: December 2.
Jacksonville, Fla.: October 24.
Jamestown, N.D.: October 14, 10 A.M.
Juneau, Alaska, 6 Shattuck Bldg.: By appointment.
Kansas City, Mo., 3100 Federal Office Bldg.: Thursday and Friday, 8:30 A.M. to 1 P.M.
Knoxville, Tenn.: September 16, December 16.
Lihue, T. H.: October 13.
Little Rock, Ark.: August 5, November 4, 1:00 P.M.
Los Angeles, Calif., 1431 Federal Bldg.: Wednesday, 9 A.M. and 1 P.M.
Louisville, Kentucky: Sometime in August and November.
Memphis, Tenn.: July 9, October 8.
Miami, Fla., 312 Federal Bldg.: Thursday.
Milwaukee, Wisconsin: Sometime in July and October.
Mobile, Ala., 419 U. S. Courthouse and Customhouse: Wednesday, by appointment.
Nashville, Tenn.: August 5, November 4.
New Orleans, La., 608 Federal Office Building, 600 South St.: Monday through Wednesday, code tests Monday only at 8:30 A.M.
New York, N. Y., 748 Federal Bldg., 641 Washington St.: Tuesday through Friday.
Norfolk, Va., 402 Federal Bldg.: Monday through Friday except Friday only when code test required.
Oklahoma City, Okla.: July 15, October 14.
Omaha, Nebr.: Somtime in July and October.
Philadelphia, Pa., 1005 New U. S. Customhouse: Monday through Wednesday, 8:30 A.M. to 10 A.M.
Phoenix, Ariz.: Sometime in July and October.
Pittsburgh, Pa.: Sometime in August and November.
Portland, Maine: October 13.
Portland, Ore., 507 U. S. Courthouse: Friday, 8:30 A.M.
Roanoke, Va.: October 3.
St. Louis, Mo.: Sometime in August and November.
St. Paul, Minn., 208 Federal Courts Bldg.: Friday, 8:45 A.M.
Salt Lake City, Utah: September 11, December 11, 1 P.M.
San Antonio, Texas: August 6–7, November 5–6.
San Diego, Calif., 15-C U. S. Customhouse: Wednesday, by appointment.
San Francisco, Calif., 323-A Customhouse: Friday.
San Juan, P. R., 323 Federal Bldg.: Friday.
Savannah, Ga., 214 P. O. Bldg.: By appointment.
Schenectady, N. Y.: September 9–10, December 2–3.
Seattle, Wash., 802 Federal Office Bldg.: Friday.
Sioux Falls, S. D.: September 15, December 8, 10 A.M.
Spokane, Wash.: Sometime in September.
Syracuse, N. Y.: Sometime in July and October.
Tampa, Fla., 410 P. O. Bldg.: By appointment.
Tulsa, Okla.: August 19, November 18.
Tucson, Ariz.: Sometime in October.
Wailuku, T. H.: October 9.
Washington, D. C., 718 Jackson Place, N.W.: Tuesday and Friday, 8:30 A.M. to 5 P.M. Code test 9:30 A.M. and 1 P.M.
Wichita, Kansas: Sometime in September.
Williamsport, Pa.: Sometime in September and December.
Wilmington, N. C.: December 5.
Winston-Salem, N. C.: August 1, November 7.

NOTE: Only General Class and Amateur Extra Class license examinations are given at FCC offices and examining points listed above. All examinations for Novice, Technician and Conditional Class licenses are conducted by volunteer supervisors.

MINUTES OF 1959 ANNUAL MEETING OF THE BOARD OF DIRECTORS

THE AMERICAN RADIO RELAY LEAGUE, INC.

MAY 15, 1959

1) Pursuant to due notice, the Board of Directors of The American Radio Relay League, Inc., met in annual session at the Hotel Statler, Hartford, Connecticut, on May 15, 1959. The meeting was called to order at 9:30 A.M. EDST with President Goodwin L. Dosland in the Chair and the following directors present:

P. Lanier Anderson, Roanoke Division
James P. Born, Jr., Southeastern Division
John H. Brabb, Great Lakes Division
Victor Canfield, Delta Division
Milton E. Chaffee, New England Division
Gilbert L. Crossley, Atlantic Division
R. W. Denniston, Midwest Division
John G. Doyle, Central Division
Harry M. Engwicht, Pacific Division
Alfred M. Gowan, Dakota Division
Morton B. Kahn, Hudson Division
Claude M. Maer, Jr., Rocky Mountain Division
Raymond E. Meyers, Southwestern Division
Grady A. Payne, West Gulf Division
Alex Reid, Canadian Division
R. Rex Roberts, Northwestern Division

Also in attendance, as members of the Board without vote, were Wayland M. Groves, First Vice-President; Percy C. Noble, Vice-President; F. E. Handy, Vice-President; A. L. Budlong, General Manager. Also in attendance, at the invitation of the Board as non-participating observers, were Great Lakes Division Vice-Director Dana E. Cartwright; New England Division Vice-Director Carmine A. Polo; Southwestern Division Vice-Director Virgil Talbott. There were also present Treasurer David H. Houghton, Technical Director George Grammer, Assistant General Manager John Huntoon, Assistant Secretary Perry F. Williams, General Counsel Paul M. Segal, and Robert Marmet of his office.

2) On motion of Mr. Engwicht, unanimously VOTED that the Minutes of the 1958 annual meeting of the Board of Directors are approved in the form in which they were issued by the Secretary.

3) On motion of Mr. Denniston, unanimously VOTED that the Annual Reports of the Officers to the Board of Directors are accepted and the same placed on file.

4) On request of Mr. Chaffee, RULED by the Chair that the report of the Finance Committee is deferred until later on the agenda. On request of Mr. Brabb, RULED by the Chair that the report of the Planning Committee is deferred until later on the agenda. Mr. Born, as Chairman, read the report of the Membership & Publications Committee, and the same was unanimously ACCEPTED and placed on file. Mr. Anderson, as Chairman, read the report of the Merit & Awards Committee, and the same was unanimously ACCEPTED and placed on file. Mr. Canfield, as Chairman, reported briefly for the Housing Committee and indicated that he would have specific recommendations later in the agenda.

5) On motion of Mr. Engwicht, unanimously VOTED that the Annual Reports of the Directors to the Board of Directors are accepted and the same placed on file.

6) At this point, supplementary oral reports were rendered by the officers and the General Counsel of the League.

7) Moved, by Mr. Denniston, that in Article 5 of the Articles of Association, the sentence, "The Board shall meet annually at a time and place as provided in the By-Laws," shall be changed to read "The Board shall meet twice annually at times and places as prescribed in the By-Laws." After discussion, the yeas and nays being ordered, the question was decided in the negative: whole number of votes cast, 16; necessary for adoption, 9; yeas, 7; nays, 9. Those voting in the affirmative were Messrs. Crossley, Denniston, Doyle, Engwicht, Kahn, Meyers, and Reid. Those voting in the negative were Messrs, Anderson, Born, Brabb, Canfield, Chaffee, Gowan, Maer, Payne, and Roberts. So the motion to amend the Articles was REJECTED.

8) On motion of Mr. Roberts, unanimously VOTED that the request of the affiliated Council of Amateur Radio Clubs, Inc., of Portland, Oregon, for holding an official ARRL National Convention at Portland, Oregon, during the summer of 1962 is APPROVED.

9) Moved, by Mr. Engwicht, that the General Manager review an overall incentive licensing plan and present to the Board the viewpoint of the Federal Communications Commission in this matter; but, after discussion, with the consent of his second, Mr. Engwicht withdrew the motion.

10) Moved, by Mr. Engwicht, that the General Manager be instructed to ask the FCC for an increase in the power limit in the 420-Mc. band to 1 kw, if it can be determined that such an increase will not interfere with other services sharing this band. If a blanket increase is not feasible, for technical reasons, consideration should be given to a power increase for that part of the band used in the continental U. S. but, after discussion, with the consent of his second, Mr. Engwicht withdrew his motion.

11) Moved, by Mr. Engwicht, that the General Manager be instructed to ask the FCC to change their rules or regulations concerning dual identification when using RTTY, so that identification by use of A-1 telegraphy will not be required. But there was no second, so the motion was LOST.

12) The Board was in recess from 10:34 A.M. to 10:48 A.M.

13) Moved, by Mr. Payne, that the League recognize a fratermity of amateur radio operators dedicated to applying the Golden Rule to on-the-air operating practices, and as a reward therefore that each amateur so cited be awarded a suitable certificate. But there was no second, so the motion was LOST.

14) On motion of Mr. Crossley, unanimously VOTED that the Communications Manager examine the membership and appointment status of the Maryland, Delaware, District of Columbia Section of the Atlantic Division, with the view to future action placing Delaware on an independent ARRL Section basis when more operational appointments and membership makes this feasible.

15) On motion of Mr. Crossley, unanimously VOTED that the mileage rate of reimbursement for League travel in private cars shall be 8½¢ per mile, retroactive to May 1, 1959.

16) Moved, by Mr. Crossley, that the Technical Department of the League give consideration to the writing of stock articles of the type for local newspaper consumption on the matter of TVI, cable-radiation interference, TV-oscillator radiation, etc. (this is with the aid to improving local public relations toward the amateur). After discussion, on motion of Mr. Brabb, unanimously VOTED that the matter be laid on the table.

17) Moved, by Mr. Crossley, that the Editor of *QST* give consideration to the establishment of a Novice section in *QST*, and include at least one article each month especially interesting to the Novice operator. After discussion, on motion of Mr. Denniston, unanimously VOTED to amend the motion by striking the text and substituting therefor the following: The Board compliments the editorial staff of *QST* for its good work in providing articles and information for Novices and suggests that the Beginner section in the Table of Contents of *QST* be called the Novice & Beginners section. Whereupon, the question being on the motion as amended, the same was unanimously ADOPTED.

18) On motion of Mr. Crossley, after discussion, unanimously VOTED that the League through a Board committee investigate the possibility of TV programs on amateur radio (such as the recent program over WCAU) under the public relations department of the TV stations. (It may be that a station will be willing to put a program live and make film for presentation by other TV stations, the League to pay for the filming, with credit to the originating station.)

19) Moved, by Mr. Crossley, that the League develop a public relations program in Washington, D. C., for better cooperation with the offices of the Federal Government and personnel. That a part-time office be established at that location. After discussion, on motion of Mr. Brabb, unanimously VOTED that the matter be laid on the table.

20) Moved, by Mr. Crossley, that the General Manager investigate the possibility of business establishments including public relations items on amateur radio in their national advertising. But the motion was REJECTED.

21) Moved, by Mr. Crossley, that the General Manager be instructed to print on appropriate card material (ap-

(*Continued on page 150*)

Ivory Tower Confessions

Do You Need a Beam?

BY DON MIX,* W1TS

I AM one of those grey-hairs they call an Old Timer, having been weaned on the whine of a rotary spark gap back in the twenties. (Unless the place has been renovated, some of the studs of that gap are still imbedded in the ceiling.) Much later on, with a full kw., a Vee beam and a lot of sweat I worked some DX and garnered pre-war, pre-Danny DXCC certificate No. 9.

But this is not a story of the good old days or of how to work DX with a kilowatt. It is for the youngsters of today, and others, who think like I did that you can't work DX these days with less than a full gallon and a 4-element tri-band beam. And it goes to show that no matter how long you've been hanging around the low end, your callouses may turn out to be only blisters.

It all started 18 months ago. I hadn't been on the air for some time with the excuse, which I believed was a valid one, that I couldn't put up an antenna that would get out of my own back yard — in this case a mighty short haul.

Then one day I was offered the loan of a Viking Valiant. This was a different proposition. With little or no work involved in the installation, what was there to lose? Nevertheless, it was several weeks before I worked up enough enthusiasm to tuck the thing under my arm and take it home. I still didn't know what I was going to do about an antenna.

But after setting the critter up on a card table, I couldn't just sit there and look at it. Maybe I could hook something to it temporarily that would get me out to W9 on 20. I couldn't see any way of getting up anything long enough to take soup on the lower-frequency bands, even if I laid it on the ground. After scrounging around, I came up with a moth-eaten length of RG-8/U. (You have to have coax, Jeeves, because it's the only thing that will fit the kind of output terminal they put on rigs these days.) Apparently the mice had been at this piece, for the outer vinyl covering was missing in several places. But a check with a light bulb showed that there were no shorts. What was more important to me at this reluctant and unbelieving stage was that someone had put a connector on one end that would fit the one on the Valiant, and a pair of soldering lugs at the other end.

For the "antenna" I cut two 16-ft. lengths of No. 22 stranded plastic-covered hook-up wire, measuring by the rule that your armspread is the same as your height. Which I knew very accurately. Stripping one end of each piece, I twisted connections onto the soldering lugs at the end of the RG-8/U.

* Assistant Technical Editor, *QST*.

After dark, I sneaked out on the second-floor rear porch to the family pulley clothesline. I tied a knot in one end of the wire and pulled it tight around the lower strand of the clothesline. After running the line out to the coax feed point, I wrapped string around the RG-8/U and tied it to the clothesline to take the weight off the hook-up wire. Then I continued to run the clothesline out, hoping that I would run out of "antenna" before the far end started coming back to me on the upper strand. By feel, in the dark, I found that I had about a foot to spare. I chocked the pulley with a clothespin to keep the wire in place. My "antenna" was up and I hadn't set a foot outside the house! Later, out of curiosity, I measured the height by dropping a string to the ground. It was 14 feet 11 inches at the ends and varied from about 11½ to 13 ft. at the middle, depending on the humidity. The outer half cleared the garage roof by about three feet. De-icing was no problem — I just shook the clothesline.

The coax was fed in through a window near the card table. There was quite a bit of excess length and this was wound with three or four turns around a near-by steam radiator to keep the line from running back out the window.

With the pi network in the Valiant, the final loaded beautifully. A check showed that the 100 kc. at the low end of 20 that has been left reasonably clear for electronic-key testers, iron-curtain f.s.k. and a little ham c.w. could be covered by tuning the v.f.o. only.

At this point it dawned on me that I needed a receiver too. The only thing on hand at the moment that would pick up a ham signal was the two-tube regenerative receiver that had been built for ARRL's *How to Become a Radio Amateur*, and a single-tube 20-15-10 converter (*QST*-

October 1956) that would work into it at 80 meters. The bug was beginning to bite hard now and I couldn't wait until I could chisel something better. Besides, after what had been said in print about the little receiver, I couldn't afford to turn up my nose at it. So the Valiant went over on the steam radiator, giving its v.f.o. temperature compensators something substantial to work on, and the three-tube receiving set-up went on the card table.

After locating the 20-meter band with the band-set padder, one of the first signals I ran across was a nice fat one with a 2-kc. yoop and a 10-kc. drift signing CX1BO. It might be a good idea to limber up the rusty fist with a few practice calls before trying for that W9. What's this? 579? Who, me? Between Juan's yoop and my shaky fist, that first contact was a nightmare, but it sure put new life into the old carcass.

Ten minutes later CX2CO gave me 589. I was burning a groove down the main Avenida of Montevideo. Wonder if the antenna (no quotes this time) will work in some other direction. Here's 4X4FA. "569," he says. The little three-tube job is really pulling them in even though the tuning rate was never intended for this sort of work and the selectivity depends on how good your imagination is.

That first week end, more urgent business (name it, you say?) cut operations short. The DXCC total stood at 7. But by the end of the second week end the number of countries worked had jumped to 51. When this fact was coaxed out of me Monday morning, it was accepted with narrowed eyes and a skeptic, "How many confirmed, pal?"

By this time I had become rather fond of the little receiver and my ears had developed a 20-db. peak for a 300-cycle beat note. Wonder if I could make DXCC with it. It took 37 on-the-air days to do it. The last 10 countries took 12 days, mostly because it took that long to find 10 new ones. If you work 100 countries, they can't *all* be pushovers. Such molasses as LX, VQ4, FF, ZC4, IS, PX, FE, UG, CR6, UD, ZP, FQ, HP, EL, VQ6, UA9, KG6, 4S (where's my QSL, Shanthi?), OQ, JA, PZ and KS6 don't often show up in these parts without attracting plenty of flies.

About this time, while waiting for 20 to peak up one day, I cranked the one-tube converter down to 15. The band was open. I shifted the Valiant down there and found that the 20-meter dipole would load the final on this band too. After several DX contacts to prove that the thing was working, I shifted to 10. But the impedance on this band was outside the range of the pi network. (That means it wouldn't load, Jeeves.) I dug out some more hook-up wire and cut separate dipoles for 15 and 10, measuring to the same accuracy as with the 20-meter wire. I connected them, along with the 20-meter dipole to the end of the RG-8/U. The outer ends were suspended, allowing some sag, from the 20-meter dipole, insulated with pieces of string.

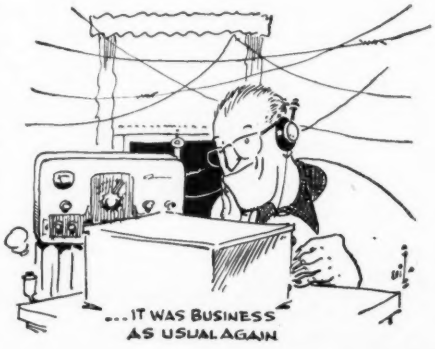
I couldn't see that there was much improvement on 15, although the settings of the pi network were closer to instruction-book numbers. On 10, the final could now be loaded as easily as on the other two bands — proof that the added elements were doing something. On 20, there was nothing to indicate that the additions had been made. Several Asian contacts on both 15 and 10 within the next few days showed that the soup wasn't "staying in the coax."

In case someone asks what my s.w.r. was, I'll put it this way. At first, I'd get an r.f. bite whenever the bug worked its way over too close to the receiver cabinet. I didn't mind the burns too much, but when it happened I'd often sign W1TH or W1TI and the QSL for that contact would go to someone else. After grounding the receiver and transmitter cabinets to the steam radiator, I didn't get nipped any more, so I assume that my s.w.r. was 1:1. Or close to it.

Along with the expansion to three bands, I acquired a better receiver. It has more bandspread and the signals on the unwanted side of zero beat are pretty well down. But on the side that I want, where the signals *are*, I still have about as much trouble as ever. However, the magnificent slide-rule dial is marked in kilocycles, so I hardly ever call on 20 any more while I'm listening on 15 as I did for an hour the day I missed ZS3B.

In the Fall, the W/VE contest came along. I stuck with it until 20 petered out. I shifted the receiver to 40 and there they were again. I switched the rig to 40. The final loaded, but after half an hour of calling the only thing I raised was a W3 who gave me 339 and then decided he had been too generous and went off to better pickings.

I felt like Robinson Crusoe. *Robinson Crusoe?* Maybe I could weave a pair of shoes out of bark, too. There was still some hook-up wire left. I clipped one end of the roll onto the near end of the 20-meter dipole and proceeded to zig-zag the wire through the house. I didn't quite know whether I should aim for a quarter wave or a half wave with that slightly unorthodox method of feed. The answer came when I ran out of both wire and space simultaneously at the front porch. The length was what you might call a compro-



mise — about ⅜ wavelength on 40. The final loaded up to rating and a few calls showed that it was business as usual again. Later that night I tried it on 80 and snagged all of the few VEs I found working there. When the ARRL DX contest came around in the Spring, F, SM, G, PA and CN8 were worked with the same setup on 40. S3s and 4s to be sure, but the EU signals were no bargains either.

This system was operated, mostly on 20, without change for 10 months. The log showed contacts with over 2000 different DX stations. Some 150 of these were Asians, most of them directly off the northwest end of the dipole. DXCC stood at 160. Only two difficulties had developed. The first was that the antenna had to be taken down on Mondays if I wanted fresh socks. The other was that on windy days the extra dipoles had a tendency to wrap themselves around the 20-meter dipole. When this happened there would be an arc while the elements welded together — sufficient proof to me that the dipoles were indeed working independently and not in some sort of one-hunk-of-metal unison. If it happened at night I could usually see the arc from the window, the relative elevations being such that I looked down on the antenna from the operating position rather than up at it. In the daytime I could tell by the change in loading. If the band wasn't too hot and the weather reasonable, I would go out and reel in the antenna and break the welds. But if I was chasing a new one, or the night was too cold, I'd simply readjust the pi network and keep going.

At the end of those 10 months, operations were shifted to another location. A prime consideration in this move was that there was plenty of room for a beam. A site was selected and many sketches were made. While waiting for these dreams to materialize, I unrolled the old antenna which I had carefully preserved for such a contingency, and threw some weighted twine up into a couple of trees. I was quite thrilled. At last I had some height — 30 ft. of it at the ends. But when I pulled her up, the center came to an abrupt stall at about 20 ft., reluctant to part with the coax which was now running in a bee-line to the transmitter in the basement. The result was something like a vertical Vee, recommended only for ionosphere soundings.

Another 8 months has now elapsed. I can't remember where I put those sketches, DXCC stands at 209 and contacts with over 3300 different DX stations are recorded in the log, about 10 per cent Asians. The 55 EU countries are confirmed, but I'm shy 4 points for DARC's WAE III — a fairly rugged one even for the big shots.

A couple of months ago, I finally got tired of heaving new twine up into the trees after every brisk breeze. I took a Saturday afternoon off and put up the ground plane described in the January issue. I can't see that I get out any better (except on 40 and 80 where the old piece of coax now has the honor of doing some radiating — intentional, that is — as a reward for its faithful service on the higher bands). But the antenna is still dangling from the tree after a winter of the wildest gales and heaviest icing. I did find, however, that coax doesn't stay flexible in low temperatures. Slight weaving at the base of the 2 × 2 eventually broke off the center conductor of the rigid coax at the feed point. I fixed it by splicing in a few inches of braid.

Of course, 250 watts isn't exactly low power. But it's 6 db. down from a kilowatt and, with a decent dipole, about 14 db. down from a gallon with a 3-element beam, plus a few more db. down if the beam is on a 70-ft. tower and the dipole is clothespin-mounted. That doesn't leave too many dbs. to play with. In an article, "DX Operating Tactics," in *QST* for August 1957, one of the DX operators contributing to the symposium came up with this prize observation, ". . . during a DX contest, with a mass of Ws calling at S8/9 level, an S5 signal will stand out remarkably. . . ." I've always thought that this must have been said with tongue in cheek. But there may be something to it after all!

I don't believe that the story told here is an isolated case. I'm sure that others have done or could do as well or better under something less than ideal conditions. I'm convinced that anyone having the patience (a prime requisite in DX work even if you own Rocky Point) can work plenty of DX if he wants to. If there's any secret to it at all, it is to use the receiver more and the transmitter less.

No doubt some readers will stand aghast at a Hq. man reverting to type on his postman's holiday. It's like the doctor who tells you to stop smoking as he drops cigar ashes in your lap. But I guess a ham is a ham is a ham is a ham . . .

P.S. The guy who loaned me the Valiant was smart. I bought it. QST

Strays

If you like science fiction, you'd probably be interested in *The Stars Are Too High*, by Agnew H. Bahnson, jr. (Random House, $3.95). There is no ham angle to it, although there is plenty of electronics, rocketry, and a beautiful blonde. However, the author is W4RQG, and this is his first novel.

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Visiting in London? The third Friday of each month the London Members Luncheon Club of the Radio Society of Great Britain meets at the Bedford Corner Hotel, Tottenham Court Road, W.C. 1. You can check on arrangements by phoning Frank Fletcher, G2FUX, at RUIslip 2763, or by calling RSGB Headquarters at HOLborn 7373. The group averages about 35 in attendance at each meeting.

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K9ADH was having language trouble in explaining to an Italian ham that he was a minister. Then he said he was a chaplain with the VA, and that didn't register either. Finally in desperation he said he was a Protestant priest. And this the Italian understood quite readily!

Hamfest Calendar

Alberta — The Calgary ARA will sponsor a hamfest at the Stampeder Hotel in Calgary on August 1 and 2. Registration begins Saturday, August 1, at 0900. Listen for VE6NQ on 28,258 kc. and 146.7 Mc. for further information, or write to J. P. McRoberts, VE6JQ, 2331 27th Ave. NW, Calgary.

British Columbia — The Okanagan Valley International Hamfest Association will hold its annual hamfest on Saturday and Sunday, July 25 and 26, at the Dolly Varden Lakeshore Auto Court, in Okanagan Falls, B.C. There will be a 75-meter transmitter hunt and a display of the latest in ham gear. Tickets are $1.00. For reservations and further information contact Bill Cameron, VE7ANQ, R.R. #2, Kelowna, B.C.

Colorado — The Denver Radio Club will sponsor the Colorado Centennial Hamfest and Picnic beginning at 1000 on July 19, at the Denver Kiwanis Picnic Grounds on U. S. Highway 40, 15 miles west of Denver. No other information available at press time.

Idaho — The annual hamfest for Wyoming, Idaho, Montana and Utah is scheduled for July 31 through August 2 at Big Springs, Idaho. Contact Tom Matthews, W7WBK, or Joe Rytting, W7DWE, both of Rexberg, Idaho, for further information.

Illinois — The third annual picnic of the Shawnee ARA will be held at the Du Quoin State Fairgrounds, in the north end of the grandstand, on July 19. A sideband dinner will precede the hamfest, on Saturday evening, July 18, at the Du Quoin Elks Club. For further info, contact Floyd Meyer, W9ZVT, 614 North Washington St., Du Quoin.

Illinois — The Hamfesters Radio Club of Chicago is celebrating its silver anniversary with a hamfest at Santa Fe Park, 9100 South Wolf Road, on Sunday, August 9. From the east, take Route 4A (Archer Ave.) to 87th St. in Willow Springs, then west to the grove. From the west, take Route 66 to 79th St., then east to Wolf Rd. Leading manufacturers will display new equipment and there will be talks, swap tables, food and refreshments, events and prizes. Advance donation is $1.10, or $1.60 at the gate. For further info or tickets, write to Betty Sandberg, W9STR, 2957 N. Monitor Ave., Chicago 34.

Illinois — The Quad-Co. ARC will sponsor its second annual breakfast club picnic at Terry Park near Palmyra on Sunday, July 26. Bring your own basket lunch. Sandwiches and soft drinks will be available on the grounds. Mobile talk-in on 3873 kc. and 29.6 Mc. from 0400 to 1100. All sorts of contests and games, including golfing and fishing. Swap table. Registration is $1.00 in advance, or $1.50 at the gate. For tickets and information contact Bob Shaw, K9OQD, 517 W. Jackson St., Auburn.

Indiana — The Kokomo ARC will hold its annual hamfest on August 9, at Highland Park, by the Big Bull. As always, the price is $1.50.

Indiana — The Indiana Radio Club Council will hold its annual "Hoosier Hamfest" at the Lake County Fairgrounds in Crown Point on Sunday, July 19. Registration starts at 1000 and the activities will wind up at 1700. Donation is $1.50. Further information can be obtained from Al Walters, W9MNO, 6819 Osborn Ave., Hammond.

Indiana — The Tenth Annual V.H.F. Picnic sponsored by the Wabash Valley Amateur Radio Association will be held on Sunday, July 26, in the Turkey Run State Park, about 40 miles north Terre Haute near Highway 41. This is an open-air affair and if you don't care to bring your own basket lunch, food is available at the Park Hotel and Restaurant. Further info is available from David Payne, K9EJO, 924 Helen Ave., Terre Haute.

Kansas — The Kansas-Nebraska Radio Club hamfest will be held on August 2 at the National Guard Armory, south of Concordia, on Highway 81.

Kentucky — The Greater Louisville Hamfest Ass'n will hold its annual hamfest on August 2 from 0800 to 1600, at Parkway Field, Louisville. It will be under cover, so come rain or shine. Food is available on the premises. Ham auction. Program for XYLs and children. Mobile contest and others. For additional information, contact Joe Poston, K9GCE, 1408 South St., New Albany, Ind.

Maryland — The annual hamfest and picnic of the Maryland Emergency Phone Net will be held on Sunday, July 12, at the Braddock Heights Park, Braddock Heights, approximately five miles west of Frederick, Maryland, on U. S. Route 40-A. There will be contests with prizes, a ham auction, a rummage sale, a ladies program, and plenty of activities for the children. Registration will be 75¢ per person, including tickets for soft drinks. Children under 12 free. Parking and picnic space will be reserved, at an additional parking fee of 25¢ per car for the park. Communications on 3820 kc. and 29.64 and 145.68 Mc., to talk in mobilers any time after 1000 EDST. Bring a picnic lunch and stay late. Advance ticket reservations may be made with Kenneth S. Teeple, W3PSP, 718 East 33rd St., Baltimore 18.

Michigan — The Pictured Rocks Radio Club of Munising will sponsor the annual Upper Peninsula of Michigan hamfest starting at 1200 Saturday, Aug. 1, and running through Sunday, Aug. 2. There will be a transmitter hunt, mobile contest, free swap and shop, scavenger hunt, informal dinner and dance, and appropriate prizes. Mobile talk-in on 3920 kc. Registration $1.00. Reservations may be made through C. Runard Seglund, W8CQU, City Water Dept., Munising.

Michigan — The Hair Net (consisting of hams who are barbers) will hold its second annual convention in the VFW building, 3017 Wildwood Ave., Jackson, on August 2. Barber or not, anyone is welcome. A banquette will be served at 1400, priced at $2.00 per plate. For further information and reservations contact Urban Pray, W8FVO, 715 N. West Ave., Jackson.

Montana — The Glacier-Waterton International Peace Park hamfest will be held on July 18 and 19, in Apgar. There will be gabfests, boat trips, movies, a hidden transmitter hunt, mobile judging, judging of home-built gear, dance, games for all ages, junk auction, and much more. Further information, and registrations, available from Mae Brennan, K7CYU, 2025 2nd Ave. North, Great Falls.

New Jersey — The Lakeland ARA will hold its annual hamfest and picnic on July 19, at the Dover Water Dept. Park, Princeton Ave. (off Route 46). Activities will begin at 1000. Registration is $1.00 for adults, children free. Box lunch, contests, auctions, etc. For further information contact Eugene Carey, K2TML, % LARA, P. O. Box 88, Rockaway.

New York — The annual southwestern New York H.F. association picnic will be held on July 12 at Great Velley. Activities for the whole family. Admission is free. For further information contact David Reinhart, K2IAX, RFD, Chaffee.

New York — The annual picnic of the South Western New York V.H.F. Association will be held July 11, at the fire tower near Great Valley. Free admission, bring your own table service and tureen. There will be a hidden transmitter hunt and other activities, with special games and amusements for small fry. There will be rigs on 2, 6, 10 and 75 meters for guiding the mobiles in. Camping space is available for any wishing to stay overnight.

Pennsylvania — The annual Radio Association of Erie Hamquet will take place on Saturday, July 18, at the Beachcomber Hotel in Peninsula State Park, Erie. There will be entertainment, mobile contests, high-speed c.w. contest, v.h.f. meeting, buffet, and swimming. Reservations and information from John, J. Kozak, W3NXK, 3814 Trask Ave., Erie.

Pennsylvania — The annual picnic of the Cumberland Valley ARC will be held on July 19 at the Scotland Community Park in Scotland, about three miles northeast of Chambersburg. This is a family affair with a program for children and ladies. Bring your own lunch. Further information from the club at P. O. Box 153, Chambersburg.

Pennsylvania — The Uniontown ARC will hold its 10th annual gabfest on Saturday afternoon and evening, July 11. This will be held on the Club grounds, two miles north of Uniontown, just off Route 51 on the Old Pittsburgh Road. Registration for this stag affair is $2.00, and movies will be shown in the evening. Club station W3PIE will be on the air. Further info from the Uniontown ARC, P. O. Box 849, Uniontown.

Hamfest announcements for **Tennessee, West Virginia, Wisconsin** and **Wyoming** are listed on page 146.

More High Claimed Scores
1959 ARRL DX Competition

While we await the final results of the February-March contest, let's look over some more totals claimed by the leaders. The phones should be added to the list on page 182 of last month's *QST*.

C.W.

Single Operator

W3ECR[1]	1,000,350	351	950
W3BVN	923,640	358	860
W8FGX	874,515	337	865
W6YMD[2]	865,389	343	841
W3GRF	829,260	340	813
W2WZ	774,324	314	822
W1BIH	709,758	301	786
W3ALB	708,945	313	755
W9LNM	685,362	309	740
K2DCA	659,176	316	698
W9YSX	640,845	303	705
W4RQR	617,232	308	668
W9HUZ	611,544	307	664
W1JYH	505,608	299	664
W3DBX	552,240	260	708
W2JVU	538,269	269	667
W4FVR	536,256	266	672
W1LOP	521,118	262	663
W9ERU	511,875	273	625
W6WWD	509,736	268	634
W3FGB	499,611	259	643
W2AYJ	496,062	254	651
W3MSR	494,949	259	637
W3IYE	492,378	274	599
W6KG	488,376	252	646
K2PIC	477,333	249	639
W1GET	475,540	252	637
W6TT	472,902	269	586
W0GDH	464,142	257	602
W4PNK	456,624	252	604
K2DGT	447,144	248	601
W3EIS	446,250	250	595
W2YTH	443,520	240	616
W4JAT	443,136	256	577
W9GIL	437,052	242	602
W2FBA	429,381	243	589
W1BOD	427,293	241	591
W2TQR	426,750	250	569
W6ZVQ	426,750	250	569
K4LPW	425,820	235	604
W4BJ	413,825	235	587
W6GTI	412,344	249	552
W1VG	402,246	234	573

Multiple Operator

W6RW	874,650	343	850
W3AOH	865,305	335	861
W0NTA	818,736	336	842
W4KFC	836,097	337	827
W3GHM	832,371	323	859
K6EVR	814,698	321	846
W3MSK	812,175	325	833
W3BES	751,200	313	800
W3WV	688,080	305	752
W3MFJ	676,494	294	767
W3FYS	589,680	280	702
W1ICP	556,931	279	663
VE2WW	526,023	277	633
W3KFQ	457,812	243	628

Single Operator

VP7BT	1,116,045	105	3543
KH6IJ	1,011,096	93	3624
SV0WP	625,600	74	2806
KH6AYG	577,680	80	2327
PA0LZ	505,020	76	2215
W9KLD/KL7	481,824	72	2231
KH6MG	450,300	79	1900
OZ7BG	413,220	71	1940
PA0LOU	402,634	74	1838
CE3AG	364,113	69	1759
KP4CC	363,168	78	1552
XE2OK	360,240	79	1522
G4CP	357,939	81	1525
GW3JI	339,342	69	1308
OK1HX	333,928	67	1736
VP5FP	322,650	75	1434
PA0VB	296,100	70	1410
F8VJ	283,645	71	1333
OE1RZ	280,468	59	1586
DJ1BZ	277,952	64	1467
PA0BW	272,496	68	1336
G3HJJ	271,670	70	1301
G8KP	267,852	68	1313
DL7CW	263,142	66	1329
G2DC	249,972	74	1126
G2QT	235,755	65	1209
EI9J	248,320	72	1145
KX6CW	221,431	49	1507
I1NT	220,247	61	1209
KM6BL	217,484	68	1071
UB5WF	217,404	61	1192
HB9QO	210,355	65	1091
F8ZF	209,734	71	1068
OH2LA	208,650	50	1398
KZ5LC	201,240	65	1032

Multiple Operator

UR2KAA	381,728	58	2220
OK3EA	288,696	69	1418
KX6AF	242,520	47	1720
SM6NN	205,946	54	1333

PHONE

Single Operator

W3DHM	261,660	196	445
W6VSS	266,610	170	511
W3FGB	184,977	153	403
W6AED	146,016	144	338
W9NZM	145,390	155	313
W4LNE	133,936	146	307
W4EFX	124,270	154	270
W3EQA	104,284	124	282
W4AIX	98,946	138	239
W3KT	86,352	112	257
W3DRD	75,144	124	202
W8AJW	72,011	107	225
K4UIV	70,020	90	262
W6NJU	62,328	98	212
W3BB	61,275	95	215
W3ZSS	59,691	101	197
K4TJL	56,304	102	184
W1BFB	51,480	88	195
W1GET	50,176	98	182

Multiple Operator

W3ECR	313,873	209	499
W3CGS	127,896	146	292

Single Operator

XE1AE	213,888	64	1120
TI2OE	266,640	60	1148
VP3HAG	197,880	65	1018
DJ1BZ	180,375	65	941
5A5TO	170,748	51	1116
UR2BU	107,413	53	680
ZS5JY	104,340	47	740
EA8CF	90,312	53	568
ZL1MQ	81,180	60	451
KP4APW	64,260	34	630
G2ACC	61,490	43	480
CE2CC	57,150	50	381
OH5SL	52,767	41	429
ZS6IW	36,822	38	323
VR2BC	32,967	33	333
VP5FP	29,799	33	302
CE3HL	26,622	34	261
OH0NC	18,816	32	196
PA0VB	16,183	27	198
TG9PS	15,916	23	234
5A5TF	15,594	23	226
PA0BW	15,066	27	186
KA2AP	14,100	30	156
EA4FU	11,154	33	129
VP1OLY	10,881	31	117
OZ7G	10,592	16	226
KZ5LC	10,440	40	87

Multiple Operator

GB2SM	115,974	51	758
KA9MF	41,400	36	385

[1] W3MFW, opr.
[2] K6EWL, opr.

Strays

Roy Leighton, W8UKW, is one of those who received a Class II Technical Award (an Oscar plaque) from the Academy of Motion Picture Arts and Sciences for his part in the development of a 10,000-watt studio bulb.

From oatmeal carton loose coupler and Ford spark coil to the mayor's chair of Kansas's largest city, in 39 years—that's the story of WØRC. Justus H. Fugate, 55-year-old Wichita (pop. 250,000) attorney, was licensed in 1920 as 9RC. DX for his crystal detector included NAA time signals, 9ZN and 5ZA (remember?). And, despite his smart modern rig, WØRC insists: "There's no music on the air now to equal that of a rotary quenched-spark transmitter building up at the beginning and dropping down at the end of a transmission." Over the years, he has held top Red Cross and Civil Defense communication posts and is a mainstay of the Wichita Amateur Radio Club. He led a three-man slate of Civic Progress Inc., a citizen's group, in Wichita voting this spring.

Hints and Kinks For the Experimenter

MOBILE SINK-TRAP WHIP

THE multiple-loaded 5-band mobile antenna described in "Hints & Kinks," February 1959, provided the electrical circuit for the antenna shown in the photograph, but it took a piece of common chrome drainpipe to complete the installation.

The antenna is easy to make and about the only difficulty you'll encounter will be obtaining permission from the family to cut off the car b.c. antenna about 3 or 4 inches above the car body. A Master Mobile center-loading coil, which has a ⅜-inch tapped hole at one end, will easily fit over the b.c. antenna stub. It will then be necessary to drill and tap for two ⅜ × ¼-inch machine set screws to hold the coil in place.

The sink-trap shield for the antenna is a 6¼-inch length of chrome drainpipe. I used a 1¾-inch i.d. size, but a number of different sizes are available and can be used. A large metal washer (⅜ inch i.d. × 1¾ inches o.d.) is soldered into one end of the pipe shield about ¼ inch from the tip. The shield fits over the coil (open end down) so that the stud on the coil passes through the washer. A ⅜-inch nut is screwed onto the stud to hold the shield in place. A Tenna Model A-3 standard b.c. replacement antenna whip section is placed above the shield. This b.c. replacement whip is designed to fit over the broken end of a b.c. antenna and is made fast by three set screws in the antenna base.

With the antenna sections fully extended, tap the coil for each band as described in the previously mentioned Hint & Kink. Rough tuning is done with the shield off; final adjustments are made with the shield attached.

Fig. 1—W5VTZ's sink-trap mobile antenna.

The sink-trap whip, although a compromise antenna, offers a number of mechanical advantages over the conventional all-band whips. It doesn't require your getting out of the car to switch bands and the chrome shield blends in well with a car's body trim. The antenna measures about 62 inches when fully extended.

— Roy Barnhill, W5VTZ

STABLE LOW VOLTAGE SUPPLY

HERE is a low voltage power supply that can be used for powering transistor circuits, for bias, or for any job that requires a stable low voltage. When using the unit as a bias supply, R_1 in Fig. 2 is adjusted without transmitter amplifier

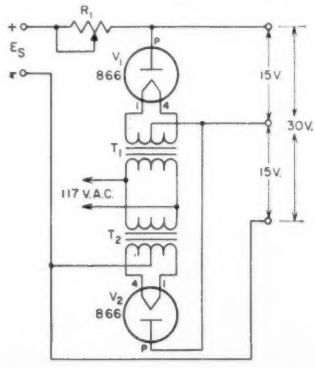


Fig. 2—Stable low voltage power supply. Voltage (E_s) for the circuit can be supplied from any available source.

excitation until V_1 draws about 5 ma. The value of R_1 can be calculated by the formula: $R_1 = \left(\frac{E_s - E_r}{I}\right)$, where E_s is the source voltage, E_r is the rated voltage drop across the tube (15 volts for the 866), and I is the current. Additional voltage to bring the bias up to the operating value when excitation is applied can be obtained from a grid leak resistor. When an 866 tube is used in the circuit, a maximum current of 250 ma. may be obtained at the low voltage output. Other tubes, such as the 816 or 83 can also be used and more can be added in series as shown in the diagram to give steps of approximately 15 volts each. Notice that filament power must be supplied by separate transformers, T_1 and T_2.

When using this circuit for a bias supply, the power source (E_s) should have its positive terminal grounded and R_1 inserted in the negative lead.

If the supply is used as a general-use low voltage supply, R_1 is adjusted until the plate current of the tube is at maximum (250 ma. for the 866).

— Capt. A. B. Jones, K9LKC

BC-348 ALIGNMENT

CARE should be taken when aligning the slugs in the i.f. transformers of the BC-348 receiver. Give special consideration to the secondary circuit (the top slug) of the transformer. Sometimes the slug-retaining spring becomes dislodged and shorts out the exposed terminals at the top of the transformer. Advancing the slug in too far will also release the spring and short the terminals.

— Garnet W. Frank

100-KC. CALIBRATOR WITH 10-KC. MARKERS

THE versatile neon-bulb sawtooth oscillator can be used to modulate a 100-kc. crystal calibrator and obtain 10-kc. marker intervals. The circuit shown in Fig. 3 uses a version of a 100-kc. oscillator found in *The Radio Amateur's Handbook*. However, the circuit may be adapted to fit almost any calibrator.

The neon-bulb oscillator is adjusted to oscillate at 10 kc. by the potentiometer R_1, and its output is coupled to the screen grid of the 6AU6 oscillator by a 30-$\mu\mu$f. capacitor. The resultant beats of the 10-kc. and 100-kc. frequencies produce 10-kc. markers between the stronger 100-kc. points. The neon-bulb oscillator will synchronize or lock in with the 100-kc. crystal-controlled oscillator, making this circuit easy to adjust. The oscillator is set by adjusting R_1 and listening to the calibrator signals on the station receiver. The 10-kc. oscillator may lock in with the 100-kc. oscillator at several settings of R_1, and the setting that gives the optimum signal strength will have to be found experimentally.

— James Bull, W7EIO

BALL-POINT SPAGHETTI

SPAGHETTI to insulate leads in high-voltage circuits can be found in discarded ball-point pen tubes, made by Scripto and Sani-Speed, for example. The pen point is easily removed from the tube. Fastidious builders can use a small piece of cleaning tissue and a stiff wire to clean out any traces of ink inside the plastic tube.

— Perry F. Williams, W1UED

EXTRA VOX SENSITIVITY FOR THE HEATH SB-10

SENSITIVITY of the VOX in my Heathkit Single Sideband Adapter SB-10 was somewhat low even with the TRANSMITTER SENSITIVITY control turned on. This was probably due to the low output from my microphone.

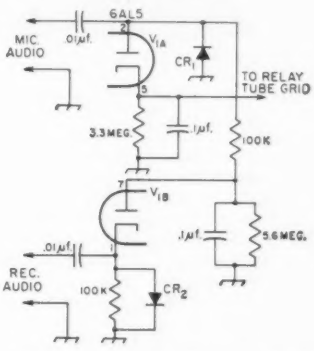


Fig. 4—Diagram showing the crystal diode voltage doublers. CR_1, CR_2 are 1N38As.

I installed a diode, CR_1, from the plate of the 6AL5 bias rectifier to ground, as shown in Fig. 4. This diode acts as a voltage doubler and gives the system more sensitivity. With the above modification it is also necessary to add some gain to the anti-trip section, this can be accomplished in the same manner with a second diode, CR_2. Although I used a pair of the newer silicon diodes for the modification, less expensive 1N38As would probably work satisfactorily.

— Lawrence S. Lewis, W2ALR

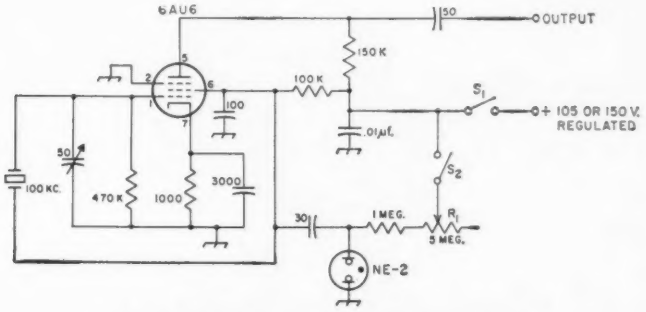


Fig. 3—Diagram of the 100-kc. oscillator with 10-kc. markers. Unless otherwise indicated, capacitances are in $\mu\mu$f., resistances are in ohms, resistors are ½ watt.

Ray Meyers, W6MLZ, trustee of K6USA and ARRL Southwestern Division Director, chats with Jerry Gross, HB9IA, acting Secretary-General of ITU Geneva, and Commodore Ed Webster, USCG (Ret.), former FCC Commissioner. In the background is a postal clerk with a sheet of NATO stamps used on all QSL cards.

K6USA-1959

AMERICAN ham-manship went on display for the world to see in Special Events Station K6USA — and it was a gratifying sight.

The station was installed and operated in the Biltmore Hotel by the Los Angeles Council of Radio Clubs during the meeting of the Ninth Plenary Session of the International Radio Consultative Committee (CCIR). CCIR studies technical problems of international radio between major international conferences.

Running 24 hours a day, K6USA rolled up a sparkling tally of 400 contacts per day, working every state and 91 foreign countries including such rare ones as the South Pole, North Borneo, St. Helena and Macau.

A Congressional bill allowed the foreign hams attending the CCIR meeting to operate the K6USA rig — a privilege greeted with enthusiasm and gratitude, according to project chairman W6MLZ, Ray Meyers, ARRL Southwestern Division Director.

"Every one of our foreign visitors that I contacted was amazed at the hospitality of the United States government in making it possible for foreign delegates to operate an American amateur radio station.

"We were able to pass third-party traffic with six countries where it had never before been possible to do so," said Meyers.

(The countries suspended their regulations against such traffic only for the duration of the conference.)

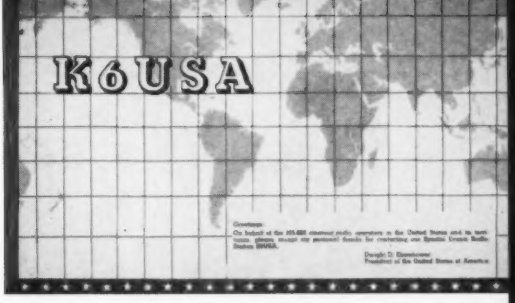
K6USA logged 9,634 contacts and received 3418 QSL cards, all of them answered thanks to W6MLZ's XYL Marge who addressed all the envelopes.

Ray admitted an exception to the rule of no QSL cards from K6USA until a QSL from the contact was received.

"We mailed one to KC4-land when we learned the operator was mailing one but it couldn't leave the South Pole for five or six months."

The station was manned by volunteers who came from all over Southern California to stand watches. The Southern California DX Club furnished DXperts for chief operators, as em-

Busy day at K6USA—Ken Gully, W6ZPM, at far left, watches unidentified 50-Club member operating 15 meters. Others are Frank Motley, W6JLH, on 20-meter rig, W6MLZ, Stan Bradley, K6PDA, Ray Halkney, W6BUD and Howard Shepherd jr., W6QJW.



This is the special commemorative QSL card that was sent to amateurs contacting K6USA. Printed in red, white and blue, the card carries a greeting and personal thanks from President Eisenhower to hams who worked the station. K6USA was operated during the Ninth Plenary session of CCIR.

phasis was on foreign contacts and third-party messages for CCIR delegates whose countries permit such traffic.

A plume in K6USA's cap was direct contact with the White House. President Eisenhower himself okayed the QSL cards. Press Secretary Hagerty at White House amateur station W3WTE extended greetings from the President and Undersecretary of State C. Douglas Dillon spoke.

The text of President Eisenhower's message was carried on page 70 of June *QST*, but W6MLZ will supply a complete text of the entire White House contact to those sending him a self-addressed, stamped envelope.

Meyers, chairman of the Amateur Activities Committee established for the CCIR meeting, extended thanks to Los Angeles amateurs, "the whole division and the AF MARS technical net which did a most magnificent job.

"Ray Halkney, W6BUD, who acted as our Chief Operator, Joe Boyer, W6UYH, our Antenna Engineer and Fred Dickson, K2HJU, who was drafted from the CCIR delegation to act as our Chief Engineer, put in many long hours to make sure things ran smoothly.

"We were also grateful to such well-known hams as W1BUD, W2KH, K2AAA, W3NAL, W3RE, W3AP, W4GF, HB9IA and many others — including George Jacobs of Voice of America for their work behind the scenes in our behalf."

K6USA donated gear included a Collins S-line and kw. linear, the Hallicrafter Ht32/33A kw., the Eldico 100/1000F kw., the Gonset G100 and linear, the Johnson kw. table top and a Gonset Communicator III with the 50-watt linear.

The Santa Fe Railroad and Los Angeles and San Diego CD-RACES groups helped put K6USA Mobile-Railroad on the rails. Operators made 132 contacts through the Mt. Lee repeater station while rolling toward San Diego at speeds up to 90 m.p.h.

"Amateurs may wonder why we parked on specific frequencies during the K6USA operation," said Meyers.

"This was deliberate, done to preclude interference and permit all equipment to work simultaneously. It also let the FCC monitoring stations know where we could be found in the band for warning when things went wrong.

"Unfortunately, the only time we had trouble with equipment was when someone tried to tune up the gear on un-posted frequencies.

"One case resulted in TVI in the hotel and the other put out spurious signals which Santa Ana noted immediately.

"A telephone call took care of that and the operator was told to keep hands off or go home and work us from his own station."

Herbert Hoover, jr., W6ZH, was honorary chairman of the Amateur Activities Committee; vice-chairmen were William S. Grenfell, W4GF; Howard Shepherd, jr., W6QJW, and Merrill Swan, W6AEE.

The ARRL presented 15 foreign amateurs with cloth-bound *Handbooks* autographed by the Headquarters staff and extended its hospitality at a dinner meeting with the 50-Club of California.

The whole project's success was summed up by Dr. Joachim of Czechoslovakia who said amateur radio could do more for world relationships than all the diplomatic corps in the universe. QST

Chief Operator Dick White, W6OZ, operates c.w. on 20 the first day of K6USA while an unidentified 50-Club member chats on 40 s.s.b.

12th V.H.F. Sweepstakes Results

DX on 50 Mc. during the 1959 running of the V.H.F. Sweepstakes was not quite up to the record conditions of 1958, so scores and reporting dropped back a shade from the 1958 level. The 12th edition was far ahead of any previous v.h.f. contest except its predecessor, however, and by all indications January 10 and 11 was one of the most exciting and challenging week ends in v.h.f. history. There were smatterings of F_2 DX, sporadic-*E* skip and aurora — but not enough of any one to make the contest a runaway for any particular kind of DX specialist or resident of a favored area. Everyone seemed to get some kind of break, and as a result contest activity was probably more uniformly spread across the map than ever before.

The tabulation of the 1129 logs received shows 59 ARRL Sections represented, from Maine to San Diego and Puerto Rico to Alaska, but we could find few records broken. The Taylor brothers, K2ITP and K2ITQ, Riverton, N. J., posted the country's top score for a home station again. Using 50, 144 and 220 Mc., phone and c.w., Joe and Hal worked 487 stations in 27 sections, for 35,964 points, just a whisker below their 1958 record. In the single-operator category the leader was W3TXY, Philadelphia, who won the Eastern Pa. Section, working 332 stations on 50 and 144 Mc. for 18,042 points. W2BLV, Haddonfield, N. J., Southern New Jersey winner, also worked 332 stations, but with a lower section multiplier came up with 17,264 points. George worked 50, 144 and 432 Mc. The greatest number of contacts by a single operator was 404, the work of W3HYJ. Catching only 10 sections dropped him back to the No. 3 spot in the country.

Some phenomenal scores were turned in by Middle Western v.h.f. men. K9DOE and W9ROS swept the Chicago area clean on 50 and 220 Mc., with 290 and 303 QSOs, respectively. Extra sections snagged on 6 paid off for K9DOE, enabling him to lead his rival for Illinois section honors by 60 points, with a total of 13,392, the best outside of the Atlantic Seaboard's high activity concentrations. W8RLT, Livonia, Mich., worked 169 stations on 50 and 432 Mc., for 9184 points.

Stations on the East and West Coasts made good use of F_2 DX chances on 50 Mc. to run up impressive section totals. Leader in this category was W6BAZ, Santa Rosa, Cal., with 29. Paul was heard over a longer period on the East Coast than about any other westerner. K6TYW, San Mateo, and W1OAK, Orange, Vt., shared second place in sections worked, with 25. The latter, Ann Chandler, former Vermont SCM, used c.w. effectively during the aurora periods, providing contacts with that hard-to-get section for 65 6-meter operators. W2ORI, Lockport, N. Y., showed that sections can be worked on 144 Mc., too. John caught 18 of them on that band alone. He was the only award winner (WNY) who used only 144 Mc.

Some fine totals were run up on one band. Helen Harris, W1HOY, Medfield, Mass., led the field on 50 Mc. with 236 contacts in 18 sections, for 13,216 points and the Eastern Mass. honors. Not far behind was 2-meter man W2BV, Mini-

CLUB SCORES

Club	*Aggregate*	*Certificate Winner*
South Jersey Radio Assn.	343,130	W2BLV
Dayton Amateur Radio Assn.	194,912	W8LPD
Mt. Airy V.H.F. Club (Pa.)	185,285	W3TYX
Midwest V.H.F. Club (Ill.)	168,637	K9DOE
6 Meter Club of Chicago	123,346	K9HWY
Hampden County Radio Assn. (Mass.)	76,941	W1RFU
Hartford County Amateur Radio Assn.	76,742	W1LGE
Mobile Sixer's Radio Club (Pa.)	52,834	W3HFY
Waltham Amateur Radio Assn. (Mass.)	45,117	W1MTT
Keystone V.H.F. Club (Pa.)	34,018	W3LSV
Six Meter Club of Dallas	29,745	K5RCZ
North Penn Amateur Radio Club (Pa.)	28,480	W3TDF
Connecticut Mobiliers	24,636	W1KLK
Southern California V.H.F. Radio Club	21,380	W6PUQ
Midwest V.H.F. Assn. (Mo.)	20,310	KØJNH
National Capital V.H.F. Society	18,004	W4LTU
Rochester V.H.F. Group	17,744	W2UTH
York Road Radio Club (Pa.)	17,600	W3UZF
Lake Success Radio Club (N. Y.)	16,024	W2YHP
Chester County Emergency Net Club (Pa.)	14,927	W3VXJ
Lakeland Amateur Radio Assn. (N. J.)	14,868	W2BDL
Five Towns Radio Club (N. Y.)	13,637	K2VIX
IBM Radio Club (N. Y.)	10,958	W2LWI
51-30 Club (Mass.)	11,876	K1CMU
Canton Amateur Radio Club (Ohio)	11,566	K8MZS
Quinebaug Valley Radio Club (Mass.)	11,378	W1NJW
Stuyvesant High School Radio Club (N. Y.)	11,102	K2VDR
Confederate Signal Corps (Ga.)	9829	K5AWT/4
Radio Assn. of Western New York	9294	K2GUG
Springfield Amateur Radio Club (Ohio)	8112	W8EHW
Radio Amateur Megacycle Society (Ill.)	7744	K9GVD
Syracuse V.H.F. Club	7698	W2RHQ
Air Capital Amateur Radio Assn. (Kans.)	7084	KØAQJ
V.H.F. Institute of New York	5266	W2WCR
Central New Jersey V.H.F. Society	4589	W2GKR
Narragansett Assn. of Amateur Radio Operators (R. I.)	4582	K1AZH
Central Michigan Amateur Radio Club	4528	W8CKK
Kingswood School Radio Club (Conn.)	4428	K1HMU
Northern New Jersey Radio Assn.	4308	K2VsE
Central Iowa V.H.F. Amateur Radio Club	3568	WØNWX
Frozen Ocean V.H.F. Society (N. Y.)	3290	K2QLE
McPherson Amateur Radio Club (Kans.)	3276	WØETX
St. Croix Valley Radio Club (Maritime)	3034	VE1LT
Southern Counties Amateur Radio Assn. (N. J.)	2922	W2TUR
Joliet Amateur Radio Society (Ill.)	2852	K9PRB
Newington Amateur Radio League (Conn.)	2580	W1TCJ
Tektronix Employees Amateur Radio Club (Ore.)	2486	W7RPT
Town of Barnstable Radio Coub (Mass.)	2325	KN1GNC
Hughes Amateur Radio Club (Cal.)	1702	KN6LFO
Asheville Amateur Radio Club (N. C.)	258	K4ONO & K4PRG

Dick Wilborg, K2HLA, Packanack Lake, N. J., worked 278 stations on 50 and 144 Mc. for 13,344 points, to win the Northern New Jersey section award in the 12th V.h.f. Sweepstakes.

tola, N. J., with 232 in 17, for 12,528. K9HWY, Chicago Ridge, Ill., worked 251 stations on 50 Mc. for 12,450. Down in Arlington, Texas, Betty Becker, K5MJW, found 156 stations in 16 sections to work on 6, for 8086 points. Best contact total on 144 Mc. was 236 stations, by W3IBH, Philadelphia. Charlie's section total was low, so he had only 8024 points to show for this effort. At least two Novices showed that respectable scores can be made, even in the unpopular part of one band, and with a 75-watt power limit. KN3DLO and KN1GRF both worked 108 different stations, for 2808 and 3034 points, respectively.

As always in the V.H.F. SS, it was the clubs that made the contest the huge success that it was. Making it four in a row, and seven out of the last eight, the South Jersey Radio Association once more demonstrated their supremacy in the v.h.f. contest field. The Dayton Amateur Radio Association poured it on this year, in a determined effort to oust SJRA, but they missed by a considerable margin. The DARA finish was their best yet, however, and SJRA cannot relax too much. The Dayton gang have shot up from ninth to sixth, fourth and now second, since 1956. The Mt. Airy V.H.F. Club of Philadelphia moved up two notches, to third place, dropping the Midwest V.H.F. Club from second to fourth. A newcomer to the first five this year is the 6-Meter Club of Chicago, in the fifth spot. Two long-time rivals had to make way here. The Hampden Country Radio Association and the Hartford County Amateur Radio Association slipped to sixth and seventh in the national club ranking, their private contest being won by the former by a mere 199-point margin. The 50 clubs in the tabulation represent an all-time record.

July *QST* is the latest that a V.H.F. SS has ever been reported in print. The large volume of logs is partly responsible, but the main factor is the haphazard nature of some of the reporting. Standard forms are available free of charge, to make record-keeping easy for every participant. If you don't have these at the last minute, the form reports should take is spelled out clearly in every contest announcement. Care in making out contest logs, and in following through on the rules regarding club entries would speed up checking here by many man-hours. Please study the rules, and do your part!

SCORES

In the following tabulation scores are listed by ARRL divisions and sections. Unless otherwise noted, the top scorer in each section receives a certificate award. The highest-scoring Novice and Technician also receives a certificate in each section where at least three such licenses submitted valid contest logs; footnotes denote these winners. Columns indicate final score, number of contacts, number of different sections worked, and the bands used. A represents 50 Mc., B 144 Mc., C 220 Mc., D 420 Mc., E 1215 Mc. or higher. Multioperator stations are shown at the end of each section tabulation.

ATLANTIC DIVISION

Eastern Pennsylvania

W3TYX
18,032-322-18-AB
W3HYJ
16,140-404-10-AB
W3KKN
16,107-384-11-ABC
W3TDF
13,286-256-16-AB
W3HFY..9720-270- 8-AB
W3FSC..9112-268- 7-AB
W3SAO..8400-280- 5-AB
W3CL...8280-276- 5-AB
W3IBH..8024-236- 7-B
W3HYO..7648-239- 6-AB
W3HKZ..6460-171- 9-A
W3IZU...6216-222- 4-AB
W3ZSS...5856-183- 6-AB
W3UZF..5760-192- 5-AB
W3FQD[1]..5656-202- 4-A
W3AJF...5580-186- 5-AB
W3JSD...5568-174- 6-A
K3BCM..5552-174- 6-A
K3BHK..5152-184- 4-AB
K2LXI/3..5117-151- 7-A
W3ULC..4950-165- 5-AB
W3SMK..4940-190- 3-AB
W3VXJ...4902-129- 9-A
W3GHM..4806-134- 8-AB
W3LSV...4752-132- 8-A
W3AMO..4592-164- 4-A
W3AYG..4480-160- 4-AB
W3FOZ...4368-156- 4-AB
W3ZOR...4144-148- 4-A
W3JBA...4046-145- 4-A
K3BED..3668-131- 4-A
W3SXD..3570-105- 7-AB
W3YWW..3472-124- 4-A
W3CXU..3367-130- 3-AB
W3FEY...3264-102- 6-ABC
W3CPT...3250-125- 5-B
W3SYN..3224-124- 3-A
K3EOD..3224-124- 3-A
K3ATX/3
3198-123- 3-A
W3BYF..3080- 70-12-B
K3CHN..3080-110- 4-A
KN3DLO[2]
2808-108- 3-B
KN/K3CXV
2640- 88- 5-AB
W3BRU...2604- 93- 4-A
W3TXO..2600-100- 5-A
W3UKG..2520- 90- 4-A
W3SST...2436- 87- 4-AB
W3OWW..2400- 75- 6-AB
K3BGT...2268- 81- 4-A
K3AAX/3
2240- 70- 6-A
W3DYL..2210- 86- 3-A
K3ERZ...2184- 91- 2-B
W3JRY..2100- 70- 5-A
W3HWV..2040- 85- 2-AB
W3MVF..2002- 77- 3-A
W3GNU..1950- 75- 3-A
W3WIJ...1950- 75- 3-A
W3OZP...1898- 73- 3-B
K3BKH..1824- 57- 6-A
W3ZIE...1820- 70- 3-A
KN3DXC
1800- 75- 2-B
W3GXB/3
1794- 69- 3-B
W3BQU...1704- 71- 2-A
K3BVZ...1704- 71- 2-A
W3FLD..1586- 61- 3-A
W3IMW..1560- 60- 3-BB
W3FQI...1508- 58- 3-AB
W3WJC..1508- 58- 3-AB
W3DRC..1456- 52- 4-AB
K3ETV...1417- 55- 3-AB
K3DJC...1404- 54- 3-A
W3UQJ...1400- 50- 4-AC
W3WZH..1352- 52- 3-A
W3VGN..1344- 56- 2-B
W3DIR...1326- 51- 3-A
W3DBN..1316- 47- 4-A
K3DXS...1300- 50- 3-A
K3ATL...1260- 42- 5-A
K3HAU...1222- 47- 3-A
W3CLT...1200- 50- 2-AB
K3GDL...1183- 46- 3-A
W3JAY...1176- 49- 2-B
W3UMI...1128- 47- 2-B
K3GQJ...912- 38- 2-A
W3LDA/3..900- 30- 5-A
K3AVF...896- 32- 4-A
KN3GFR..888- 37- 2-B
W3FMF...780- 30- 3-A
K3CDR...767- 30- 3-A
W3BUR...754- 29- 3-AB
KN/K3GWQ
748- 34- 1-AB
W3LRH...744- 31- 2-A
K3CKA...728- 28- 3-A
W3ZYO...624- 26- 2-A
W3GDV...552- 23- 2-B
W3EDO...546- 21- 3-B
W3IIO...504- 21- 2-B
K3AIB...492- 21- 2-A
W3LEM...480- 20- 2-B
KN3GZV..480- 20- 2-B
KN3DGB..442- 17- 3-B
KN3DGC/3
416- 16- 3-B
W3CBH...360- 15- 2-B
K3GOZ...348- 15- 2-A
W3DRF...336- 14- 2-B
KN3EOS..336- 14- 2-B
W3JWF...216- 9- 2-A
W3KLL...198- 9- 1-A
W3NWP...144- 6- 2-A
K3BRJ....88- 4- 1-B
W3RHT....72- 3- 2-A

W3ZRR....22- 1- 1-A
W3LXM/3 (4 oprs.)
5148-143- 8-AB
W3IXL (W3s LXL K3ECB)
4200-140- 5-A
K3CIV (K3s BPP CIV)
3390-113- 5-A
K3CHF (K3s AVV CHF)
2808-108- 3-A
W3UBO (W3U BO K3DMA)
2460- 82- 5-A
W3ICU/3 (4 oprs.)
1512- 54- 4-B

Md.-Del.-D. C.

W3LCC...3366- 99- 7-ABC
W3AHQ...3080-110- 8-ABC
W3ASD...2958- 87- 7-A
W3KMV..2774- 73- 9-A
W3CGV...2336- 73- 6-ABCD
K3AZH[1]..2184- 84- 3-A
W3AET...1804- 41-12-A
K3BBH...1764- 63- 4-A
K3GJU...1508- 58- 3-A
K3AMG...1352- 52- 3-A
KN3HFV.1300- 50- 3-B
W3HYE..1296- 54- 2-A
W3MNE..1222- 47- 3-A
W3TFA...1176- 49- 2-AB
W3HB....1144- 44- 3-B
W3SQP...1144- 44- 3-B
W3VAM...928- 29- 6-A
W3PWK...700- 25- 4-A
KN3EXR..504- 21- 2-B
W3MME (W3s HWJ MME)
552- 23- 2-A

Southern New Jersey

W2BLV
17,264-332-16-ABD
W2PAU
12,804-292-12-AB
W2BV...12,528-232-17-B
W2KFC
11,120-280-10-AB
W2EIF...9920-310- 6-AB
W2JAV...9130-299- 9-AB
K2HOD...7524-209- 8-AB
W2OSD..7140-238- 5-AB
K2ZZT...6675-223- 5-AB
W2EWN.6258-224- 4-AB
W2REB..5628-201- 4-AB
W2ZUL...5544-198- 4-AB
K2TYW[1].5148-143- 8-A
W2HTL...5096-182- 4-A
K2DCF...4590-153- 5-B
K2HJY...4590-153- 5-AB
K2MIO...4452-159- 4-AB
K2BPX...4446-171- 3-AB
K2GCD...4312-154- 4-AB
W2NFL...4200-150- 4-AB
K2JVX...4200-150- 4-AB
K2MPV...4186-150- 4-AB
W2ESX...4155-139- 5-AB
W2LBX...4004-143- 4-AB
K2OQN..3952-152- 4-AB
K2UDA...3926-151- 3-AB
W2ADA..3864-138- 4-AB
K2EQU...3864-138- 4-A
WA2BFX.3864-138- 4-A
W2BAY...3780-135- 4-AB
K2AFJ...3766-135- 4-B
K2KIQ...3720-155- 2-AB
K2GSJ...3406-131- 3-B
K2LMN..3328-128- 3-A
W2TQK...3304-118- 4-A
W2OGZ...3248-116- 4-AB
W2YRW..3080-110- 4-A
K2KCL...2052-109- 4-A
K2DEI/2.3024-126- 2-AB
K2CJK...2800-100- 4-B
K2PTJ...2665-105- 3-AB
K2MQQ..2652-102- 3-A
K2KTS...2626-101- 3-AB
K2SXN...2626-101- 3-A
K2QOK...2604- 93- 4-A
W2CME..2568-107- 2-AB
W2YRW..2496- 96- 3-B
K2JKA...2457- 95- 3-A
W2LY....2376- 99- 2-B
W2FXT...2340- 78- 3-AB
K2TZH...2280- 95- 2-A
W2GVB...2256- 94- 2-B
W2ESG...2236- 86- 3-AB
K2UKU...2210- 85- 3-A
K2ZID/2..2210- 85- 3-B
W2ORA...2132- 82- 3-AB
K2YIB...2132- 82- 3-B
K2HPJ...2106- 81- 3-B
WV2AGK[2]
2040- 85- 2-B
W2SDO...1920- 80- 2-AB
K2MBT...1872- 78- 2-B
W2SZP...1848- 77- 2-B
K2OHM..1848- 77- 2-A
WV2AXG.1824- 76- 2-B
W2DMU..1800- 75- 2-A
KN2MKD
1728- 72- 2-B
W2VX....1680- 70- 2-B
K2BZK/2.1680- 70- 2-B
W2TUR...1634- 43- 9-A
K2SUN...1586- 61- 3-B
K2BG....1560- 60- 3-B
K2UFE/2.1536- 64- 2-B
K2RHB...1344- 56- 2-AB
W2TAV...1320- 55- 2-B
KN2PX8/2
1320- 55- 2-B
W2HVE...1300- 50- 3-B
KN2PWQ.1296- 54- 2-B
W2OUY...1248- 52- 2-B
W2AKI...1224- 51- 2-AF
K2VXW..1224- 51- 2-B
K2CRX...1200- 40- 5-A
K2UXB...1152- 48- 2-A
W2SDZ...1104- 46- 2-B
WV2CIL..1080- 45- 2-B
W2MEO...1008- 42- 2-B
K2PWM..1008- 42- 2-A
WV2CCZ..984- 41- 2-B
W2ZX....948- 40- 2-B
K2MZP...888- 37- 2-B
K2LDG...858- 33- 3-A
K2RRC...792- 33- 2-B
W2DAJ...768- 32- 2-B
W2OSR...728- 28- 3-B
K2ZRJ...700- 25- 4-A
W2SDB...648- 27- 2-A
W2BUI...528- 22- 2-A
W2PJD...456- 19- 2-A
K2VUQ...364- 14- 3-A
W2QDY...240- 10- 2-A
W2IAJ....192- 8- 2-A
W2UMC...132- 6- 1-A
K2ITP (K2s ITP ITQ)
35,964-487-27-ABC
K2TUY (K2s LBO TUY)
2884-103- 4-A
K2PPC (K2s KCI PPC)
2758- 99- 4-AC
K2MNZ/2 (W2JMW K2-MNZ)...2314- 89- 3-A
K2ZOM/2 (WA2ABF KN2-PXS K2ZOM)
2160- 90- 2-B
K2MGZ (2 oprs.)
1224- 52- 2-A

Western New York

W2ORL...6216-111-18-B
W2UTH..5060-115-12-AB
W2RHQ..4608- 96-14-AB
K2GUG..3390-113- 5-AB
W2SOK...3096- 86- 8-ABC
K2DBB...2960- 7 4-10-A
W2LXE...2916- 81- 8-B
K2QLE...2432- 76- 6-A
K8JLC/2..2268- 81- 4-AE
W2OWF..2016- 77- 4-AB
K2IXB[1]..1672- 76- 1-A
K2ZFV...1488- 62- 2-A
K2MPE...1456- 52- 4-A
K2ALZ...1254- 57- 1-A
K2GXT...1232- 56- 1-A
K2HBV...968- 44- 1-A
WV2BTB..936- 39- 2-B
W2YIK...832- 26- 6-A
W2KIO...814- 37- 1-AB
K2QWC...796- 36- 1-A
K2EAK...720- 30- 2-A
K8KZI/2..720- 30- 2-AB
W2QY....672- 28- 2-B
W2PDO...660- 30- 1-A
K2TXG...638- 29- 1-A
K2QPC...594- 27- 1-A
K2YGF...572- 26- 1-A
K2LXD...504- 21- 2-A
K2PKK...484- 22- 1-A
K2ZRX...396- 18- 1-A
K2TCP/2..374- 17- 1-A
W2WZR...340- 10- 7-B
W2GBN...234- 9- 3-B
W2BLO...192- 8- 2-B
K2QVC...176- 8- 1-A
K2ZBU (K2s UFZ ZBU)
4484-119- 9-A
K2ERQ (7 oprs.)
3440- 86-10- AB
K2ELE (5 oprs.)
1368- 57- 2-AB
K2DUR/2 (4 oprs.)
1040- 40- 3-AB
K2CVX/2 (W2JGJ K2CVX)
576- 24- 2-AB

Western Pennsylvania

W3RUE...3608- 82-12-AB
W3BWU[1].3480- 87-10-A
W3AWU..2452- 76- 6-A
W3M8R/3
1204- 43- 4-B
W3GQT...840- 35- 2-B
W3NRG...528- 22- 2-AB
W3MJC...216- 9- 2-B
W3EPM....40- 2- 1-A
K3DKO (4 oprs.)
480- 20- 2-A

CENTRAL DIVISION

Illinois

K9DOE.13,392-290-14-AC
W9ROS..13,332-303-12-AC
K9HWY
12,450-251-15-A
K9CSI..12,012-231-16-A
W9WOK..8100-162-15-AB
W9EZN..6987-213- 7-AB
K9LFO...6678-159-11-A
W9HOZ...5882-173- 7-AB
K9JFQ...5760-144-10-A
W9EET...5712-136-11-AB
K9DWR..5206-137- 9-AC
K9MHB..4960-155- 6-A
W9YVP...4896-153- 6-A
K9DTB...4598-121- 9-A
W9OBW..4503-119- 9-AB
W9VGT..4216-124- 7-A
K9JMX..4208-132- 6-A
K9DPV...4192-131- 6-A
K9JVZ...4160-131- 6-A
W9EQC..3638-107- 7-ABC
K9OLU..3502-103- 7-A
K9EFU...3468-109- 6-A
W9IMG..3458- 91- 9-A
W9RPH..3424-107- 6-AB
K9EFR...3408-107- 6-A
K9AHK..3105-104- 5-A
K9CNN/9
3080-110- 4-A
K9AMI...2988- 83- 8-A
W9ZKQ...2976- 93- 6-A
W9MYC..2968-106- 4-AB
K9JDE...2955-100- 5-AB
W9QVN..2940-105- 4-AB
K9MVO...2820- 94- 5-A
W9NYO..2688- 84- 6-A
W9MCG..2685- 90- 5-A
K9MVD..2618- 77- 7-A
K9GVD...2470- 95- 3-A
W9PPW..2464- 88- 4-AB
K9ITS...2422- 87- 4-A
K9HCL...2400- 80- 5-A
K9JFN/9.2400- 80- 5-A
K9IHI...2340- 90- 3-A
K9JNA...2278- 67- 7-A
K9CNV...2272- 71- 6-A
K9ICY...2160- 60- 8-A
KN9OUP
2142- 77- 4-B
W9VEU...2100- 70- 5-A
K9DKG..2086- 75- 4-A
K9DOC...2080- 80- 3-A
K9CXL...1980- 66- 5-A
K9JAK...1960- 70- 4-A
K9OEF...1890- 63- 5-A
K9CS8...1820- 70- 3-AB
K9KMK..1820- 70- 3-A
K9MUY..1768- 68- 3-A
K9JRQ...1728- 72- 2-A
K9KGK..1666- 60- 4-A
K9POX...1652- 59- 4-A
K9GFW...1620- 54- 5-A
K9PKW..1612- 62- 3-A
K9KLA...1610- 62- 4-A
K9GUB...1600- 62- 6-A
K9KCK...1600- 50- 6-A
W9AKR..1586- 61- 3-A
K9LGB...1586- 61- 3-A
W9FTT...1560- 60- 3-B
K9MOV..1548- 65- 2-A
K9EEC...1540- 55- 4-B
W9DBJ...1536- 64- 6-A
W9KTB..1512- 54- 4-B
K9EVS...1498- 55- 4-A
K9APQ...1484- 53- 4-A
K9CTA...1440- 45- 6-A
W9MKW.1417- 57- 3-A
W9DWD..1368- 57- 2-AB
K9ETP...1320- 55- 2-A
W9JFP/9.1290- 43- 5-A
W9YNQ..1272- 53- 2-A
K9DLS...1260- 45- 4-A
K9LTC/9
1260- 55- 2-A
K9PRB...1258- 37- 7-A
K9KPM..1232- 44- 4-A
K9DHH..1215- 44- 5-A
W9JEE...1176- 42- 4-A
K9AZE...1170- 45- 3-A
W9RGH..1152- 32- 8-A
W9LYA/9
1120- 40- 4-B
W9YYS...1100- 50- 1-A
W9UU....1078- 39- 4-A
W9VIG...1056- 44- 2-A
K9KZG...1056- 44- 2-A
KN9MFE
1040- 40- 3-B
K9GIS...1032- 43- 2-A
K9INV...1032- 43- 2-A
W9NW....980- 35- 4-B
W9HPG...962- 37- 3-B
K9EWY...946- 43- 1-A
W9MGN..884- 34- 3-A
W9DYX...880- 40- 1-A
W9EGI...880- 40- 1-A
K9JHR...880- 40- 1-A
W9MHC..840- 35- 2-AB
K9LYL...832- 32- 3-B
W9AGM..814- 37- 1-AB
K9ERT...814- 38- 1-A
K9EOI...792- 42- 1-A
W9ADO..784- 28- 4-B
W9BJX...768- 32- 2-A
W9EXP...754- 29- 3-B
K9ARU...754- 29- 3-A
K9LFU...748- 34- 1-A
W9PDN...728- 28- 3-A
W9VPU...728- 28- 3-B
K9EMM..728- 26- 4-A
W9PZP...700- 25- 2-B
K9IVB...663- 26- 3-A
K9BDJ...648- 27- 2-A
K9PBN...648- 27- 2-A
W9VCT...624- 30- 2-A
KN9LRJ..624- 26- 2-B
W9FQR...616- 28- 1-AB
K9GTS...616- 28- 1-A
K9KEQ...605- 28- 1-A
K9OTS....594- 27- 1-A
K9ITZ....588- 21- 4-A
W9IXS....572- 26- 1-A
K9DPW...572- 26- 1-A
K9PUJ....550- 25- 1-A
K9DYU....506- 23- 1-A
K9HLA....504- 21- 2-A
K9HIJ....432- 18- 2-A
W9SLZ....396- 18- 1-AB
K9AMG...396- 18- 1-A
K9ABG...330- 15- 1-A
K9PRJ....330- 15- 1-A
W9DWW..286- 13- 1-B
K9ARA....286- 13- 1-A
K9KCG...242- 11- 1-A
K9OSR....198- 9- 1-A
K9KLV....88- 4- 1-A
W9BCJ (K9s IOW PKW PRJ)...5263-143- 9-A
W9BGX (K9s DNW OJV)
3500-125- 4-AB
K9IEH (K9s EWY IEH)
3040- 97- 6-A
W9RVG (2 oprs.)
2550- 85- 5-A
K9HRI/9 (W9UHM K9HRI)
2040- 68- 5-B
KN9PFC (KN9s LRZ PFC)
396- 18- 1-B
K9DDI (W9RYI K9DDI)
242- 11- 1-A

Indiana

K9GFQ 10,000-200-15-A
K9KGJ...5940-135-12-A
K9MMH..4680-132- 8-A
K9MZV...2240- 70- 6-A
W9MHP..2040- 60- 7-A
K9EZS...1904- 56- 7-A
W9VPN..1274- 49- 3-A
K9PGK...1066- 41- 3-A
K9IXD...1056- 44- 2-A
KN9LQZ..840- 30- 4-AB
W9OVL...756- 27- 4-AC
K9PPB....638- 29- 1-A
K9KGI (W9WKN K9KGI)
6300-150-11-A
K9DPU (K9s DPU DQE)
1768- 52- 7-AC

Wisconsin

W9JCI...8700-174-15-AC
W9TQ....1820- 65- 4-AB
W9GIR...1040- 40- 3-AB
W9DDG...868- 31- 4-AB
W9YT (W9ZQA K9EOP)
1444- 38- 9-A

DAKOTA DIVISION

Minnesota

K0AKJ..2340- 65- 8-AB
K9PST[1]..1526- 55- 4-A
W9UOA...1170- 45- 3-A
K0LAV....868- 31- 4-A
W9JHS....660- 22- 5-AB
K0ISP....442- 17- 3-A

DELTA DIVISION

Arkansas

K5IPL....1188- 27-12-A
K5AZH....540- 18- 5-A

Louisiana

K5CVY..2553- 56-13-A

Tennessee

W4IKK...4030- 78-16-A
K4DSC...1680- 53- 6-A
W4HHK...914- 27- 7-AB
K4PZJ....480- 20- 2-A

GREAT LAKES DIVISION

Kentucky

K4HZO..6960-150-13-A
K4BPY....57- 2- 2-A

Michigan

W8RLT..9184-169-18-AD
K8DKR[1].7128-162-12-A
K8AKQ...4674-123- 9-A
W8UJC...2760- 92- 5-A
K8HNW..2686- 79- 7-B
K8MAQ..2296- 82- 4-A
W8YAN..1984- 62- 6-A
W8WVP..1672- 44- 9-A
W8VOH..1530- 45- 7-AB
K8EBX...1410- 47- 5-A
K8JEE...1309- 60- 1-A
K8HNB..1260- 42- 5-A
K8KEQ...1100- 50- 1-A
W8VRH...936- 36- 3-B
KN8NGR..806- 31- 3-B
W8CKK...656- 25- 3-B
W8ZTU...600- 25- 2-B
W8RLH...552- 23- 2-B
W8LJV....444- 23- 2-B
K8DHN...364- 13- 4-A
W8DXM...132- 6- 1-B
K8AHW....88- 4- 1-B
K8IQW....88- 4- 1-B

W8SMHZ (W8SMHZ K8INL) 4608-131- 8-A
K8BGZ (K8s BGZ EAP) 2982- 71-11-AB

Ohio

W8LPD..9072-162-18-AB
W8NRM..8832-138-22-ABC
K8BPC..7560-189-10-AB
W8SVW[1] 6228-173- 8-A
K8KOB..5795-157- 9-A
W8NAF..4620-154- 5-AB
W8IGI..4608-144- 6-ABC
K8HRD..4386-129- 7-A
W8MVL..4160-130- 6-AB
W8LOF..3960-132- 5-AB
W8INQ..3904-122- 6-A
W8GFN..3900-130- 5-AB
W8ZCV..3900-150- 3-ABC
W8UIV..3552-127- 4-A
K8ECF..3552-111- 6-A
W8HOH..3540-118- 5-AB
W8WPH..3536-104- 7-A
K8GDV..3520-110- 6-A
W8ILC..3472-124- 4-AB
W8SGX..3465- 83-11-A
W8EHW..3420- 90- 9-ABC
W8KQV..3392-106- 6-A
W8SNE..3360-113- 5-AC
W8PBX..3294- 92- 8-A
W8LVH..3204- 89- 8-AC
K8MZS..3162- 93- 7-A
K8MZT..3094- 91- 7-A
K8MDW..3030-102- 5-A
W8SVL..3000-100- 5-ABC
W8IMK..2992- 88- 7-A
K8HRR..2952- 82- 8-AC
W8PQZ..2886-111- 3-AB
K8KTL..2752- 86- 6-A
W8ARC..2704-104- 3-AB
W8NHW..2632- 94- 4-AB
W8ENH..2616-109- 2-AB
W8BAX..2400-75-6-ABCDE
K8GFU..2353- 91- 3-A
W8DPW..2304- 96- 2-AB
K8IPW..2236- 86- 3-AB
W8PLQ..2236- 86- 3-AB
W8WRH..2184- 78- 4-A
W8NPE..2160- 72- 5-A
W8TEX..2160- 90- 2-AB
K8BXU..2144- 67- 6-A
K8MHJ..2040- 68- 5-A
K8JZJ..2016- 72- 4-A
W8GHX..2010- 67- 5-AC
W8ODN..2010- 67- 5-A
K8BPB..1976- 76- 3-A
K8DMZ..1974- 71- 4-B
W8VFD..1960- 70- 4-A
K8GDX..1960- 70- 4-A
W8ZOF..1924- 74- 3-AB
W8YCP..1890- 68- 4-B
W8BMO..1807-139- 3-ABC
W8JRN..1794- 69- 3-AB
W8DWT..1656- 69- 2-AB
W8KFC..1624- 58- 4-B
K8MDX..1608- 67- 2-A
K8ITL..1602- 62- 3-A
W8IIP..1560- 60- 3-B
W8HVL..1416- 59- 2-A
W8LIL..1376- 43- 6-A
K8MUO..1344- 56- 2-A
KN8MFZ[2] 1344- 48- 4-B
W8MCS..1272- 53- 2-A
K8III..1232- 56- 1-A
W8WUP..1200- 40- 5-B
W8RLY..1176- 49- 2-B
K3CXZ/8 1134- 41- 4-A
K8ERE..1056- 48- 1-A
K8HNS..1050- 35- 5-A
K8IYK..1020- 40- 3-A
W8AAL..1032- 43- 2-B
W8TEK..946- 43- 1-A
W8EDB..936- 36- 3-B
W8WYU..924- 42- 1-B
W8KQX..902- 41- 1-A
K8GAK..880- 40- 1-A
K8IYW..880- 44- 1-A
KN8LQX..880- 40- 1-B
W8AL..858- 33- 3-A
K8KDW..858- 39- 1-A
K8MOM..858- 39- 1-A
K8IDH..845- 33- 3-A
W8WAU..816- 34- 2-B
W8ZFO..726- 33- 1-B
K8GCN..715- 33- 1-A
W8MDK..704- 32- 1-B
W8PFP..704- 32- 1-B
W8MOH..682- 31- 1-A
K8AEW..672- 28- 2-AC
K8ADI..660- 30- 1-A
K8EBI..660- 30- 1-A
W8BRU..594- 27- 1-A
W8WRN..594- 27- 1-ABC
K8IAS..594- 27- 1-A
K8JIA..594- 27- 1-A
W8SJT..572- 26- 1-A
K8GCS..572- 26- 1-A
W8RAS..484- 22- 1-A
K8IRZ..484- 22- 1-A
K8EUX..451- 23- 1-A
W8QDI..440- 20- 1-B
W8EIE..418- 19- 1-B
W8WJL..418- 19- 1-B
K8IOW..408- 17- 2-A
K8ERD..374- 17- 1-A
W8SXT..352- 16- 1-A
K8AMV..352- 16- 1-A
W8EEG..341- 17- 1-A
K8CPY..253- 13- 1-A
K8NIC..253- 23- 1-A
W8HCD..220- 10- 1-B
W8MAQ..220- 10- 1-A
K8BBC..154- 7- 1-A
W8STC..96- 8- 2-A
W8NP..88- 4- 1-A
W8DG..66- 3- 1-A
W8JJG..44- 2- 1-B
K8GKF..22- 1- 1-A
K8GYK (7 oprs.) 6540-164-10-A
K8MJI (K8s BTA IVQ MJI) 4032-126- 6-A
K8GLX (K8s GLX IJG K9EQA) 3840-128- 5-A
K8GCT (K8s GCT GCU) 3808-119- 6-A
W8RXM (4 oprs.) 3744-144- 3-AB
K8GCU (K8s GCT GCU) 3520-110- 6-A
W8SFG (W8s SFG SRW KN8KTX) 2604- 62-11-B
W8ULY (W8ULY K8BNR) 418- 19- 1-A

HUDSON DIVISION

Eastern New York

W2LWI..8448-132-22-AB
K2CBA[1]..5858-101-19-ACD
K2GCH..2268- 62- 8-AB
W2HBC..1920- 60- 6-AB
K2CVG..1088- 32- 7-A
K2PRB..868- 32- 4-B
K2BEO..494- 19- 3-A
W2TMM..480- 20- 2-A
W2IP..448- 16- 4-B
K2QVT..420- 14- 5-A
WV2CLV..392- 14- 4-B
K2OZT..240- 10- 2-B
K2BGU..154- 7- 1-A

N.Y.C.-L.I.

W2YHP..8240-206-10-AB
K2VDR..7308-203- 8-AB
K2VIX..7049-186- 9-A
K2JWT..5304-156- 7-ABC
W2VSA..3440-108- 6-BD
W2AOD..2560- 80- 6-AD
W2WCR..2336- 73- 6-B
K2TSW..2184- 78- 4-B
K2HQP..1980- 66- 5-A
KN2KVL[2] 1820- 65- 4-B
K2YOW..1764- 63- 4-A
W2TNI..1484- 53- 4-B
K2AZT..1484- 53- 4-AC
K2DTJ/2 1400- 50- 4-A
K2LEG..1344- 48- 4-B
K2RDP..1064- 38- 4-B
W2TMN..1064- 38- 4-B
W2EW..1040- 40- 3-B
K2GVL..910- 35- 3-AB
KN2KXJ..910- 35- 3-B
W2HVL..826- 30- 4-BC
W2QPQ..784- 28- 4-B
WV2BEI..650- 25- 3-B
W2WUQ..560- 20- 4-B
K2MZE..390- 15- 3-A
K2TGL..384- 16- 2-A
W2KDA..216- 9- 2-B
WA2BOY..198- 9- 1-A
K2KOA..188- 8- 2-A
W2TUK..132- 6- 1-B
K2CTK..132- 6- 1-B
K2GHE..88- 4- 1-B
K2ZXY (4 oprs.) 5632-178- 6-A
W2SAP (W2SAP K2SFA) 3584-112- 6-B
WV2CQY (WA2DCM WV2CQY) 1312- 42- 6-B

Northern New Jersey

K2HLA 13,344-278-14-AB
W2BDL..9300-186-15-AB
K2YTL..3300-111- 5-B
W2QNL..2850- 95- 5-B
K2UYH..2656- 84- 6-B
W2CBB..2436- 58-11-B
W2QJY..2044- 73- 4-B
W2GKR..2002- 73- 4-A
K2GAL..1760- 55- 6-B
W2MNK[1] 1690- 65- 3-A
K2VSE..1632- 51- 6-A
W2DZA..1472- 46- 6-ABC
K2ZFX..1442- 52- 4-A
W2FJC..994- 36- 4-B
K2DIG..840- 28- 5-AC
W2DMJ/2 741- 29- 3-AB
W2DEN..660- 22- 5-B
K2IUK..570- 19- 5-A
W2MWM..560- 20- 4-A
K2GDR..546- 21- 3-B
K2UQN..494- 19- 3-A
W2JSE..480- 20- 2-B
K2DNF/2..442- 17- 3-B
K2PTD..429- 17- 3-A
390- 30- 3-AB
W2RDP..374- 17- 1-A
W2BPU..364- 14- 3-AB
K2ZNR..260- 10- 3-B
K2ULV/2..156- 11- 2-A
W2ADE (6 oprs.) 23,738-457-16-AB
W2PEZ (7 oprs.) 14,444-314-13-ABC
K2VH8/2 (4 oprs.) 5220-174- 5-AB
K2ZSQ (7 oprs.) 3312-105- 6-A
K2EYM (3 oprs.) 2912- 93- 6-A
KN2TIJ/2 (2 oprs.) 2772- 99- 4-B
W2SJU (2 oprs.) 2432- 76- 6-B
K2OIQ/2 (3 oprs.) 1264- 40- 6-AB
W2ODV (2 oprs.) 840- 35- 2-B

MIDWEST DIVISION

Iowa

WØNWX..1634- 43-. 9-AB
KØBAN[1]..1428- 42- 7-ACD
KØHPQ..570- 19- 5-A
KØEMQ..510- 15- 7-B
KØPFI..506- 23- 1-A
KØGEY..338- 13- 3-B

Kansas

KØITF..4531- 99-13-AB
WØETX..1290- 43- 5-AB
KØAQJ..1170- 45- 3-B
KØJWT..1040- 40- 3-AB
WØMDK..816- 34- 2-B
KØGIC..792- 33- 2-B
KØATS..720- 30- 2-B
KØGIA..720- 30- 2-B
WØZJY..600- 25- 2-B
KNØPHZ[2]..504- 21- 2-B
KØGER..432- 15- 6-A
WØLZJ..408- 17- 2-B
KØATT..408- 17- 2-B
KØEKN..396- 17- 2-B
WØAPG..352- 16- 1-B
WØHAJ..286- 11- 3-B
KNØSMP..286- 13- 1-B
KØJWY..242- 11- 1-B
WØMOX..208- 8- 3-B
WØCRN..154- 7- 1-B
WØBBO..132- 6- 1-B
KNØSML..132- 6- 1-B
WØATH..110- 5- 1-B
KØAYS..66- 3- 1-B
KØDTM..22- 1- 1-B

Missouri

KØJNH..3816-106- 8-A
KØIQH..3160- 79-10-A
KØJZL..2816- 64-12-A
WØIFC..1888- 59- 6-A
KØDGG..1540- 55- 4-A
KØILA/Ø..1300- 50- 3-A
KØPJB..1056- 44- 2-A
KØKWL/Ø 1008- 42- 2-A
WØLFE..952- 34- 4-AB
KØKJV..896- 32- 4-A
KØLID..528- 22- 2-A
KØMVL..504- 21- 2-A
KØGOU..456- 19- 2-A
WØYVH..360- 15- 2-A
KØEYE..360- 15- 2-A
KØLER..286- 11- 3-A
KØQQC (6 oprs.) 5040-140- 8-A
KØLIR (6 oprs.) 2670- 89- 5-A

Nebraska

WØYZV..2268- 54-11-A
WØWRT..936- 36- 3-AB
WØJDJ..264- 11- 2-B
KØCIA/Ø (2 oprs.) 2210- 65- 7-AB

NEW ENGLAND DIVISION

Connecticut

W1HDQ[2] 16,830-248-24-ABC
W1RJA 12,420-230-17-AB
W1LGE 10,726-173-21-AB
W1PHR..7750-155-15-AB
K1CAP..6290-185- 7-B
W1RVZ..3914-103- 9-B
K1DCS..3780-126- 5-AB
W1YDS..3432-132- 3-ABC
W1VSE..3200-100- 6-AB
W1KLK..3096- 86- 8-AB
K1HMU..3024-108- 4-AB
KN1HAC[2] 2600-100- 3-B
KN1IWM 2522- 97- 3-B
W1SPX..2460- 82- 5-AB
W1JZA..2436- 87- 4-AB
K1AZG..2314- 89- 3-B
K1GTZ..2112- 88- 2-B
W1NWE..2002- 77- 3-B
W1FTX..1938- 57- 7-AB
K1AZF..1920- 80- 2-B
KN1GHZ 1920- 80- 2-A
W1WOQ..1716- 66- 3-AB
W1VNO[1]..1540- 55- 4-A
K1AOX..1540- 55- 4-B
W1BYX..1440- 45- 6-A
W1UWJ/1 1344- 56- 2-B
W1MWB/1 1200- 40- 5-B
K1DMF..1152- 48- 2-B
KN1IWK 1128- 47- 2-B
W1TCJ..1068- 45- 2-B
W1RQ..1056- 44- 2-B
K1CAK..1008- 42- 2-B
W1FVV..884- 34- 3-A
K1GHX..876- 37- 2-B
KN1JAS..840- 35- 2-B
W1YOL..816- 34- 2-A
KN1GSX..792- 33- 2-B
W1BDI[3]..780- 30- 3-B
W1AW[3,4]..768- 32- 2-B
W1GFE..720- 30- 2-B
K1EEW..672- 28- 2-B
K1AOY..600- 25- 2-B
W1YDM..528- 22- 2-ABC
W1ORG..504- 21- 2-B
W1HDF..480- 20- 2-ABC
W1INS..435- 15- 5-B
K1GSD..408- 17- 2-B
K1CKZ/1..392- 14- 4-A
W1IKL..384- 16- 2-B
W1AMJ..336- 14- 2-B
KN1HLA..336- 14- 2-B
W1JJL..288- 12- 2-AB
W1OKY..288- 12- 2-B
W1REJ..273- 21- 3-B
K1BNT..252- 11- 2-B
K1BCH..240- 10- 2-B
W1CHI..216- 9- 2-A
W1UED[3]..216- 9- 2-B
K1CAT..198- 9- 1-B
W1ZIG/1..78- 3- 3-B
K1CRQ (K1s CRQ DDO) 11,400-285-10-AB
W1ZTT (3 oprs.) 5586-147- 9-ABC
W1COT (2 oprs.) 3330-111- 5-AB
K1DZI (2 oprs.) 2632- 94- 4-B
K1DDE/1 (2 oprs.) 2576- 92- 4-B
K1ARZ (2 oprs.) 1080- 36- 5-A
K1AAC/1 (3 oprs.) 1066- 41- 3-B

Maine

K1CXX..2184- 39-18-A
W1EHF/1..286- 11- 3-A
W1TJN..168- 7- 2-AB
W1FJP (2 oprs.) 220- 10- 1-A

Eastern Massachusetts

W1HOY 13,216-236-18-A
K1BSM..7840-140-18-A
W1MTT..7266-173-11-ABC
K1DIR..6426-119-17-A
W1ELP..5292- 98-17-A
K1CMU..4160-130- 6-A
W1LMZ..4020-134- 5-AB
W1OOP..3468-102- 7-ABCD
K1DIT..3400-100- 7-A
W1JSM..3030-101- 5-AB
KN1GRF[2] 3024-108- 4-B
W1LUW..2414- 71- 7-AB
W1YVB..2272- 71- 6-AB
W1AQE..2044- 73- 4-AB
K1ADB..1830- 61- 5-A
W1QMN..1680- 56- 5-AB
W1HIC..1586- 61- 3-A
KN1JEN..1400- 50- 4-B
K1HGW..1148- 41- 4-B
W1HGN..870- 41- 5-A
K1ARD..784- 28- 4-A
W1JHY..700- 25- 4-A
KN1JIX..700- 25- 4-B
K1GPH..644- 23- 4-A
KN1GNC..504- 21- 2-B
K1BID..440- 20- 1-B
W1NPR..418- 19- 1-B
K1GRP..363- 17- 1-B
W1ILW..336- 14- 2-B
W1UMK..288- 12- 2-A
W1JMS..264- 12- 1-B
W1FY..224- 8- 4-A
W1LHF..96- 4- 2-A
W1LFM..88- 4- 1-A
W1LHM..72- 3- 2-A
W1LUG..60- 3- 1-B
K1AIC (2 oprs.) 756- 27- 4-A

Western Massachusetts

W1RFU
15,350-308-15-ABC
W1VNH..9407-205-13-ABC
K1AMZ[1]..6636-158-11-A
K1UCG...6264-131-14-B
W1MTV..4828-142- 7-B
K1ICM...4500-125- 8-A
K1CZY...2470- 96- 5-B
K1DAI...2418- 93- 3-B
W1RRX..2210- 85- 3-B
W1JWV..2100- 75- 4-B
K4UMR/1
2080- 80- 3-B
W1NJW..1890- 63- 5-A
W1MQK..1885- 73- 3-B
W1HMN..1820- 70- 3-AB
W1ALL/1
1742- 67- 3-B
W1NDW..1742- 67- 3-B
W1BCI...1728- 64- 6-A
W1ESA...1680- 70- 2-B
W1STR...1604- 64- 3-AB
K1ICS...1540- 55- 4-A
W1NMQ..1530- 48- 6-A
W1OY...1464- 61- 2-AB
KN1HXY[2]
1464- 61- 2-B
W1MNG..1404- 54- 3-AB
W1FBF...1380- 46- 5-A
K1KZZ...1378- 53- 3-B
W1UKR..1352- 52- 3-AB
K1EEB/1
1344- 48- 4-A
W1PHU..1326- 51- 3-AB
K1CYG..1326- 51- 3-B
K1GJU...1320- 55- 2-B
W1HYO..1260- 42- 5-A
W1JMM..1200- 40- 5-A
W1TXS...1200- 50- 2-B
W1ICW...1170- 49- 2-B
W1BXB..1170- 45- 3-AB
K1IXP...1120- 40- 4-A
W1FAB..1092- 42- 3-AB
K1URE..1092- 42- 3-B
K1AZL...988- 39- 3-A
W1OBQ...984- 41- 2-B
W1EFC...980- 35- 4-A
W1HUN..962- 37- 3-A
W1KUL...858- 33- 3-AB
W1BH....816- 34- 2-B
K1BRX...810- 27- 2-A
K1BUB...744- 31- 2-B
K1AUN...702- 27- 3-A
W1UCB...676- 26- 3-A
W1NY....528- 22- 2-B
KN1ISQ..528- 22- 2-B
K1CRK...504- 21- 2-A
W1CSF...432- 18- 2-B
KN1GCV/1
308- 14- 1-B
K1DUA...176- 8- 1-A
W1BRF (2 oprs.)
2592- 81- 6-A
W1EHF/1 (2 oprs.)
260- 10- 3-A

New Hampshire

W1FZ/1..5650-113-15-AB
W1VAU..1326- 39- 7-A
W1MHL/1 (multiopr.)
19,343-421-13-AB
W1HPM (6 oprs.)
8418-183-13-ABC

Rhode Island

W1WTR..3150- 78-11-A
K1CRN/1
2400- 80- 5-B
K1AZH...2268- 63- 8-A
K1DFU...1836- 51- 8-A
K1ADK...1230- 41- 5-A
W1REK...650- 25- 3-B
K1EGM...154- 7- 1-A
K1BAX...120- 5- 2-A
W1SKT (5 oprs.)
2040- 68- 5-AB

Vermont

W1OAK..4550- 65-25-A
W1EXZ...1728- 32-17-A
W1MMN 1344- 32-11-B

NORTHWESTERN DIVISION

Alaska

KL7CJN...44- 2- 1-A

Montana

W7EPZ...480- 16- 5-A
W7SFK...130- 5- 3-A

Oregon

W7HNW..4347- 95-13-AB
K7AAD..2420- 55-12-A
W7HBH..1560- 52- 5-AB
W7EPT...962- 37- 3-A
W7SEZ...600- 25- 2-AB
W7QND..576- 24- 2-A
W7VOK...216- 9- 2-A
W7UNT...132- 6- 1-B

Washington

W7RT...6672-139-14-AB
W7RDY..3586- 82-12-AB
W7EMX..1456- 52- 4-A
K7BBO...1456- 56- 3-A
W7JKZ...612- 18- 7-A
W7VCB...286- 13- 1-A

PACIFIC DIVISION

Santa Clara Valley

K6TYW..9520-137-25-AB
K6MZN..7781-126-21-AB
W6VMY..3082- 67-13-A
W6GGV...450- 15- 5-BCD
W6?BC...420- 15- 4-ABD
WA6CLT..156- 7- 3-A
K6TJL/6 (4 oprs.)
7946-137-19-AB
K6SLQ/6 (7 oprs.)
7614-141-17-AB

East Bay

K6RNQ..7130-115-21-A
K6DLY/6
1545- 52- 5-B
W6BXN/6 (4 oprs.)
5200-163- 6-AB
WA/WV6AGA/6 (2 oprs.)
5010-168- 5-AB
K6ITZ (2 oprs.)
720- 20- 8-A

San Francisco

W6BAZ..7098- 91-29-A
K6VXI...1760- 55- 6-A
W6CQC...704- 22- 6-A

Sacramento Valley

W6PIV...1288- 46- 4-AB
K6RPQ (2 oprs.)
1533- 37-11-A

San Joaquin Valley

W6OVR/6
2414- 71- 7-AB
W6BJI...2240- 56-10-A

ROANOKE DIVISION

North Carolina

W4ACY..1980- 55- 8-AB
W4VHH...120- 5- 2-B
K4ONO....96- 4- 2-A
K4PRG....96- 4- 2-A
K4KSM....66- 3- 1-A
W4ZZ/4 (3 oprs.)
5450-109-15-AB

South Carolina

W4ASD..1178- 32- 9-AB
W4VIW...702- 20- 8-A
W4TLC...368- 12- 6-A
K4YUX...288- 9- 6-AB

Virginia

W4LTU..3280- 82-10-AB
K4RAY[1].2970- 83- 8-AC
K4UKQ..2926- 77- 9-A
K4SSA...1980- 55- 8-A
K4JOY...1176- 49- 2-B
W4AUR..1170- 45- 3-B
KN4VWH.696- 29- 2-B
K4SYP....576- 48- 2-A
K4BCP/4..476- 17- 4-A
W4CB (4 oprs.)
3496- 76-13-AB

West Virginia

K8HRO...4116- 98-11-A
K8CMW/8
3600- 72-15-A
K8IYU...3515- 93- 9-A
W8FN1/8 (2 oprs.)
2540- 64-10-AB

ROCKY MOUNTAIN DIVISION

Colorado

W0AZT..4264- 83-16-AB
K0SDK..2712- 57-14-A
K0CLJ...1976- 53- 9-A
W3OTC/0.738- 21- 8-A
W0IJR/0 (2 oprs.)
2562- 61-11-A

New Mexico

K5IQL....918- 26- 8-AB
K5TEF....208- 8- 3-AB
K5LWU (2 oprs.)
66- 3- 1-AB

SOUTHEASTERN DIVISION

Alabama

W4HOB..1840- 46-10-A
K4GQK....48- 2- 2-A

Eastern Florida

W4RMU..5022- 83-21-AB
W4FNR...224- 8- 4-A

Western Florida

K4YIP...1200- 32-10-A
K4ZAC....384- 12- 6-A

Georgia

K5AWT/4
3197- 70-13-A
K4TFY/4
1620- 45- 8-A
K4OSW...1548- 43- 8-A
W4BGE...1344- 42- 6-A
K4RJT....992- 31- 6-A
W4GIS....768- 32- 2-AB
K4RJS....374- 17- 1-A
K4UUW...264- 12- 1-A
W4VVZ...220- 10- 1-A
K4CFN....176- 8- 1-AB
W4ISS....168- 6- 4-B
K4ETX....88- 4- 1-A
K4GIA....88- 4- 1-A
W4AAY....48- 2- 2-B
W4VZR (3 oprs.)
990- 28- 8-A

West Indies

KP4ABN..504- 18- 4-A
KP4AMN.228- 10- 2-A

SOUTHWESTERN DIVISION

Los Angeles

W6PUQ..2808-108- 3-A
W6NLZ
2408- 44-18-ABCDE
WV6DAB[2]
1456- 94- 3-B
W6TOI[3]
1056- 44- 2-B
KN6LFO..672- 56- 2-B
W6PFE...480- 20- 2-AB
K6QPH...468- 18- 3-A
K6UGE...432- 18- 2-B
W6BWG...420- 15- 4-AB
KN6SWI..312- 13- 2-B
K6ECV....195- 8- 3-B
W6SDW/6 (W6SDW K6BTJ W8NWD)
13,328-427- 6-AB
WA6CID (6 oprs.)
11,308-237-12-ABC
K6MSB/6 (4 oprs.)
7264-227- 6-ABC
K6PZN (2 oprs.)
728- 28- 3-A
K6QEH/6 (2 oprs.)
286- 13- 1-B

Arizona

W7RUX..3000- 60-15-AB
W7QLZ/7.176- 8- 1-A

San Diego

K6COE/6.1820- 70- 3-AB
W6ISQ....144- 6- 2-B
K6YLQ/6 (3 oprs.)
3800-100- 9-A
K6TOP/6 (3 oprs.)
624- 26- 2-A
K6OXH (4 oprs.)
544- 17- 6-A

WEST GULF DIVISION

Northern Texas

K5MJW..8086-156-16-A
K5RCZ..5658-123-13-A
K5BDL..4104-114- 8-A
K5BLI...2760- 60-13-A
K5BKC...2130- 71- 5-AB
K5SCV...2108- 62- 7-A
W5FEG..2080- 65- 6-A
K5RJU...1800- 45-10-A
K5OQE...1760- 55- 6-A
K5GHR...1748- 46- 9-A
K5KWB..1615- 48- 7-A
K5KVE...1530- 45- 7-A
W5MJD..1024- 32- 6-A
K5AON..1008- 36- 4-AB
K5ADV....962- 37- 3-A
K5CHF....638- 29- 1-A
W5HOD...624- 26- 4-A
K5RBV....440- 20- 1-A
K5DCQ/5.330- 15- 1-A
K5KDY....264- 12- 1-A
K5PIG....264- 12- 1-A
W5HOI....132- 6- 1-A
K5STI (K5s MBZ STI)
12,804-197-23-A

Oklahoma

K5MNX..7056-126-18-A
W5PZ.....858- 33- 3-B
W5MFX...120- 5- 2-B

Southern Texas

K5JFN (4 oprs.)
2898- 63-13-A

CANADIAN DIVISION

Maritime

VE1OD...1850- 38-15-A
VE1ZR...1541- 35-13-A
VE1EF....714- 21- 7-A
VE1LT....615- 21- 5-AB
VE1PF....495- 16- 5-AB
VE1ABL..288- 12- 2-AB
VE1ACJ...264- 12- 2-AB
VE1DP....240- 10- 2-B
VE1ER....240- 10- 2-B
VE1WB....240- 10- 2-B
VE1AET...216- 9- 2-B
VE1JP....216- 9- 2-B

Quebec

VE2AXY..779- 21- 9-B

Ontario

VE3DIR..3840- 80-14-B
VE3AIB..2010- 67- 5-B
VE3AGB.1776- 74- 2-AB
VE3CIR..1008- 42- 2-B
VE3DSU..784- 28- 4-AB
VE3ATB...504- 21- 2-AB
VE3DWQ..456- 19- 2-B

British Columbia

VE7AQQ..1334- 29-13-A

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[1] Technician award winner. [2] Novice award winner. [3] Hq. Staff, not eligible for award. [4] W1QIS, opr. [5] W6UFJ, opr.

Non-competing: *W1s* HAX OP, *K2s* JPD TXG ZAT, W3-KWH, W4LFN, W5VKH, W8NWX/8, K8CJS, *W9s* HXK UCF YOI, *KHs* ISQ JRM KCQ.

Strays

A couple of friendly hams: Two Ohio hams selected lots for new houses on Hickory Ridge Avenue in Brunswick. W8BID discovered his house number was 73 . . . W8NYX moved into 88.

—···—

Remember the lucky guy, Don Murray, who starred opposite Marilyn Monroe in "Bus Stop"? Ham Don Murray, in North Miami, Fla., says the phonetics of his call, KN4FMA are: Famous Movie Actor. Who says the FCC gives these calls out by chance? Unfortunately, KN4FMA is not actor Don Murray.

How's DX?

CONDUCTED BY ROD NEWKIRK,* W9BRD

Hmmm:

In a buoyant moment a couple of years ago we editorially expressed our desire to see photographic evidence of a collection of QSLs for QSOs with ARRL DX Century Club members in 100 or more DXCC-type countries. The squib went so:

> Your ARRL DX Century Club made its own "DXCC" years ago, and now amateurs in well over 100 countries have qualified for such certification. Question: Has anyone amassed QSLs from DXCC members in 100 or more countries? Though nonendorsable, we could term this deal DXCC-DXCC or DXCC.[2] Nope, *don't* ship us the cards; but we're interested in clear black-and-white photos of the first DXCC[2] QSL collections called to our attention. Last December *QST*'s complete DXCC roster, plus Honor Roll "New Members" listings since then, will aid your research.

W6KG promptly produced the first DXCC[2] with cards collected as DL4ZC. W4LVV quickly followed suit with the first U.S. filing, then CE3DZ took the next trick with South America's initial entry. The game was afoot! Dust from other DX QSL files around the globe mushroomed up in a billowing cloud. Arrayed on facing pages to follow you will note four more pictorial DXCC[2] filings, plus acknowledgment of a fifth, which bring our total collection to a strapping thirteen.[1] W6TPJ's accompanying letter includes this comment:

> . . . This without doubt is the most difficult award I have ever had the occasion to achieve. Whether you know it or not, many members of the Southern California DX Club and other DXers in this area are very much interested in obtaining this award. And the many personal letters I have received from foreign amateurs, in answer to my requests for their cards for DXCC[2], indicate that they are working toward it, too. So don't let this award die.

Which behooves us to make it clear that our DXCC[2] frolic constitutes no "award" in the commonly construed sense. There's no certification; there are no "rules" beyond those simple stipulations in April 1957 *QST*.

Many among the DX gang find this specialized DXCC[2] proposition a challenging pursuit and have heartily adopted it as an entertaining diversion. Any intrinsic values in the thing? Well, we've observed a few QSOs and PSE-QSLs between topnotch DXCC members who normally only ignore or QRM each other. *That's* something.

Perhaps some day an enterprising DX club will sponsor DXCC[2] or reasonable facsimile thereof, on a solid rules-plus-certification basis. The interest obviously is there. Promotional publicity already is *fait accompli*. Meanwhile "How's" will accept a W2's gay suggestion that we turn our attention to the possibility of DXCC[3] — collections of QSLs from DXCC members in 100 or more countries who have collections of QSLs from DXCC members in 100 or more countries.

Oh, the powers of DXCC!

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K2THA contributes to our Why-Didn't-We-Think-of-That Department concerning the QSL pitfall of date-abbreviation confusion. As you probably have discovered, much of the DX world employs, say, "12–1–58" to mean December 1, 1958; but to others this clearly signifies January 12, 1958. It's a critical matter when rare confirmations are at stake. So Ron recommends that we all stay off the air for the first twelve days of each month, thus eliminating all chance of such dating ambiguity.

Aw — to be truthful, that's his alternate suggestion. K2THA more seriously moves for the universal use of Roman numerals to abbreviate months, an approach noticeable on QSLs from European areas. Thereby "XII–1–58" or "1–XII–58" can hardly mean anything but December 1, 1958. [I'll *still* spell it out, Boss. — *Jeeves!*]

What:

Ah, summer's DX doldrums have taken the usual toll of our higher long-haul ranges (diminished m.u.f) and our lower-frequency regions (ratta-tat-tat). Twenty meters thus forges to the fore and carries the DX ball in our topside hemisphere. Time to remind you that in the next to follow, frequencies appear within parentheses, times without. Frequencies are given in number of kilocycles above the

*4822 West Berteau Ave., Chicago 41, Ill.

[1] *Hold* the phone — Ws 3ARK and 9YSX just checked in with Nos. 14 and 15!

lower band limit; *e.g.* (68) = 14,068 kc. if the paragraph treats 20 meters. Times are GMT using the nearest whole-hour figure such as 7 for 0649, and 0 for 2335. . . .

20 c.w. inclines W8KX to remark, "All in all, I consider the DX season just past rather successful in spite of frequent radio blackouts. Made many new friends and worked the minimum of 40 new countries that I set up as a target since migrating up to 20." And K2UYG declares "The way conditions are shaping up, it looks as though I'll have to rely almost entirely on 20 c.w. to furnish 'new' ones this summer." Walt, Bill, K1DCL, W2s GVZ (253/245 worked/confirmed), HMJ (283/278), JGQ KKT, K2s AYC (117/97), TBU, WA2CCC (155/84), W3s GYP KKO (136), LOS (98/76), K3BVV, K4s BYN DRO (188/169) PHY (124/102), QIJ RJM TEA, K5s ABV (122/101), JNY JZP (30/9), LGH, W6s JQB KG NKR, K7AWH (89/62), W8s CSK (134/123), YGR, K8IKM, W9ZYD, K9ELT (101/77), WØDEI (157/142), CO2US, EL4A, VEs 1PQ (241/227), 3EIL (76/48) and KA2DE give us the word on the 14-Mc. code activities of **AP**5B, **BV1**USB 14, **CE**s 9AH 5, **ØA**C **ØA**E, **CN**s 8BK 9CK, **CP**3CD 2, **CR**s 4AH 4AX 5AR 9AH, **CX**s 5CO 6AD, **CT2**BO 0–2, **DL**5BY, **DM**s 2ABM 2ADL 3KJI 3KXH, **DU**s 1RTI (57), 7SV (47) 11, **EA**s 8AJ 2, **Ø**AF (60) 16–17, **EL**4A (88) 5, F2CB/**FC** (45) 22, **FA**s 3DU 0, 8RJ 7, **FB8**s CJ (50) of Madagascar, XX 11 of Kerguelen, **FM7**WU (5) 2, **FO8**AC (90), **FP8**AP, **FY7**s YE (30), YF (10) 1, YI, **HA**s 1SP (92) 8, 5DH 5DU 5KDQ 8WS (20) 3, ØHN (90) 4, **HB1**TC/**fl** not French Somaliland but Liechtenstein, **HC1**XJ, **HH2**LD (15) 1, **HK**s 5CR **Ø**AI, **HR2**FG 3, **IS1**ZEI, IT1ZQK, JAs in quantity, **JT1**AB (62) 15–23, **JZØ**HA, K6QPG/**KW6**, K8LYK/

VP8DS is active at VP8 "headquarters" in Port Stanley, particularly enjoying 21-Mc. phone fun with a 50-watter and Eddystone receiver. (Photo via W3ICQ)

KM6, **KA**s 8KW 9MF 5, **ØI**J (305) 12 of the Bonins, **KC**s 4USV 6JC 7, **KG1**s AQ FN (70) 6, KH6BDV/**KJ6** (55) 12, **KM6**s BK (55) 10, BL, **KV4**s AA (80) 22-1, AQ (90) 3, BO (70) 0, **KW6**CU (27) 12, **KX6**s CO CU (27) 12, CN, **LA**1VC/**g**, **LA**2JE/**p** (77) 6, **LX**1RA (60) 22, LZs in number, **OD5**s AI CI 5, LX, OK7HZ/**ZA** (50), **OQ5**BC (38) 14, **OR4**RW 8 of the Belgian Antarctic, **OY8**RJ, **PJ**s 2AE 3AD, **PZI**s AM AP, **RA**EM of Moscow, **SL**5AB 16 just Sweden, SM5WN/**LA**/**p** (90) 5–9, shipboard SM8s BTM/mm near Dakar, 8YF/mm, **SU1**MS (5, 79) 4, **SVØW**N, **TI2**s DN PZ WD, **UA**s 9AR 9KCA 1, **ØLT ØO**M, **UC2**s AR 5, AX 4, BG 5, CB 5, KAC 7, **UD6**AM, **UF6**s FB 2, KDA PB 5, **UG6**s AG AW, **UH8**KBA (45) 21, **UJ8**KAA, **UL7**s JA 17, KAR, **UM8**s KAA KAB, **UNI**s AE 6, AO (35) 14, **UO5**s AA PK 1–5, RO 6, **UP2**AT 4, **UQ2**s AB AN (12) 3–7, BA (77) 7, BP, **UR2**KAA (88) 7, **VE**s 8BN **Ø**NA (84) 7, **VK9**s GK (95) 11–13, GW of T.N.G., NT RR of P.T., **VK6**s CC TF (70) 1, **VP**s 2KO (70) 4, 3YG (50) 22, 5BL 6GJ 6LN 8JIL, gobs of VP9s, **VQ**s 2GW (53) 22, 6LQ 3, **VR1**B, **VS**s 1HY 11, 5JA now QRT, 6AE 6EE 16, XE3BL, **XZ2**s AD (28) 16, TH, **YO**3s KAA RI 1, WL, YV5s BO EZ 4, **ZA**1KM 23, **ZB1**FA (50) 1, **ZC4**s IP LL (55) 22, **ZD**s 2VPF (40) 22, 7SA 0, **ZE7**JF (48) 16, **ZK2**AD (50) 3, **ZL**3VB (38) 8–9 of the Chathams, **ZP**5AY (100) 1, **ZS7**M (33) 15, 3A2AF (W6SAI), **3V8**AU, **4S7**s FJ RD (30) 11, **4X4**s IU KP, **5A**3TR, **9G1**CF (77) 22, **9K2**AN, **9M2**s DW 11 and FR (29) 16.

20 phone entertains W2HMJ*, K2SFA*, W3KKO*, K4QIJ*, **W**ØNGM*, CO2US, KA2DE, VEs 1PQ* (131 on phone, 104 sideband) and 3EIL with performances by **BV1**MK (158), **ET2US*** (310) 23, **FM7**WN, **FS7**RT*, **FY7**YF* (315) 4–5, **HZ1**AB* (315) 21–22, **KA**s 2YA* **Ø**CG **ØI**J* (295) 10 of Iwo, **KB6**BL* (280) 10, **KG4**USV* (290) 10, **KG6**s AIG* 16, NAA*, **KJ6**BV, **KM6**BII*, **KR6**AF* **KX6**s BP* (260) 11, CA CJ, **MP4B**BW* (312) 0, **OA7**Q* (297), **OD5**AB, **SP3**PL* (320) 23, **SUI**KH (172) 2, **SVØW**B* (320) 23, **TF2**WEG, **UR2**BU, Levant VEs 3EGD/**SU** (155) 3, 6QG/**SU** (160) 4, **VK9**CP, **VPs** 5AK 9CD* (310) 1, 9ET 4, **VQ4**ERR* (305) 0, **VSs** 1JG (110), 5BY (311) 10–11, **YV1**AZ 2, **3A2**AF* (307) 5, **4X4**s DH (120), DK* (320) and **9G1**BF* (305) 0, the stars twinkling for single-sideband stuff.

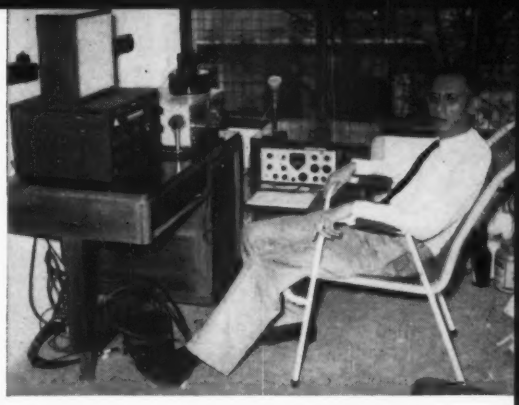
15 c.w. seems to be "K" territory; curiously, Ks outnumber our W contributors eight to one this month. Thus do we hear from K1DCL, K2UYG, W3VDV/8, K4s BYN DRO OTG/6 PHY RJM TEA, K5s JNY (opped by K5ABV), LGH LLJ, K7ADV, W8YGR, K8IKM, K9s ELT GSG JIN, EL4A, CO2US and VE3EIL who inform you of 21-Mc. beepings by that **AP5**B fellow, **CN8**FO (50, **CR5**AR, **DM2**ADC, **DU1**FM, **EA**s 8CP 0, 9AQ **EL**s 1K 4A (10) 20, **ET2**s KY (20), VB, **FQ8**HE, **FS7**RT, **GC**s 2FMV 3HFE 0, **GD3**FXN, **HA**s 5BU 5KDQ 5KFR 7PZ 8WS, **HSI**C 15, **HZ1**AB, **IT1**s AGA AI CDS (25) 20, **JA**4HP (70), **JZØ**HA, **KA2**MP, **KR6**s AK BF, **KX6**CO, **LA2JE/p**, **LZ2**KBA, **MP4B**CP, **SP**s 1KHA 6QH (10) 22, **SVØ**WY (50), **TF3**MB, **UA9**s AA (60), CM (50), VB (60), **UAØ**SO, **UB5**s AQ FJ KAB KBA KIA, **UC2**AX (70), **UJ8AJ** 14, **UO5AA** 13, **UQ2**s AN 21, AS, **VPs** 2SL 4GM 4KR 4LP 4TR 7BA (90), 9BO (80), 9CR (45) 0, 9G 9L, **VQs** 2JM 3CF 4FM, **XZ2**TH, **YO3**UU, **YV5**s ADP (80), ADZ HL (80) 20, **ZB1**s AQ FA (60), **ZC4**s GT IP (40) 21–22, JC (100), **ZD2**GUP, **4S7**FJ (30) 18, **4X4**s DH 23, LH and **5A**5TO (50). Come to think of it, the K prefix generally indicates new ham blood, a healthy DX sign!

15 phone raises the W ratio somewhat, with W2HMJ*, W3KKO*, K4s BYN (121), DRO QIJ, W5ERY, K5LGH, K8KHE (62/30), K9s ELT GSG JIN, **W**ØNGM*, CO2US, GC2RS and KA2DE volunteering data on **CN8**s CS FV IZ, **CX**2AX (225), **DU1**GF (180), **EA8**s CF CM, **FG7**XE, **FM7**WS, **FQ8**s AE AF, **GD3**s FXN UB, **HA9**OZ, **HH2**Z, **HK0**AI, **HR3**MW, **HZ1**AB, **IT1**s AQ TAI ZGY, **JA1**BD, **KC4**s USB (425) 22–23, USV (430) 0, **KG4**AU, **KM6**BP (164), **LX1**DC (200) 15, **MP4B**CC (210) 21–23, **M1B**, **OA**s 4DF 6Q (225) 7Q* (425), **OD5**AB, **OE**s 1DH (189) 1PZ 5HE 6LP, **OQ**s 5IG 5IK (200) 17, 5NC **Ø**PD (149), **OHØ**NC (410) 13, **PJ**s 2MC* (422) 13 of Sint Maarten, 3AD, **PZ1**AB, Rhodes DX scholar **SVØ**WB (200) 21, **TF**s 2WDX 2WEE 3KA, **TG**s 9PS **Ø**AA of the Guatemala Fair, **UR2**BU, **VK9**NT (153), **VPs** 2AB* 2LO 3HAG 5AA 5AB 5KS, **VQ4**ERR* (410) 20, **VR2**BC (200) 5, **VSs** 1JO 6CL (164), **VU2**SS (262) 1, **XZ2**SY (100) 19, **YA1**IW (272), **YN**4CB, **YO3**ZA, YVs galore, **ZD6**DT (201), **ZL**s 1ABA 3FM, **4X4**s BL CW GB DX* (400) 19–20, KK, **5A**2CV and **9G1**CF (415) 13, *D.X.*, the Willamette Valley DX Club organ, suggests serious scrutiny of 21 Mc. in the late evenings after the band has apparently ducked out. Plenty of choice, though weak, stuff available right on into the wee hours.

15 Novice activity affirms the theme that youth will be served. KN1IVT, up to 84/59 already, comments, "Wish I had had my license *last* year. As an s.w.l. I did extensive listening in 1958 and conditions were definitely better on fifteen then." But Chris, KN1JMB, KN2QBD, KN4s VWS ZDZ ZIW (12/3), KN5SCT, KN6TUN, WV6CRQ and KNØRAX do right nicely with **CN8**JE, **CO2**US, **CT1**CF, **CR5**AR (116), **DU7**SV, **EA**s 8CP 9AQ, **EL1**K, **FG7**XE, **FM7**WU, **HH2**Q, **HP1**SB, **HZ1**AB, **JA1**VX, **KG1**FR, **KR6**BF, **KZ5**ESN, **OD5**LX 21–22, **OE1**RZ, **OQ5**CX, **OX3**RH, **PY7**s ABQ AHB AN, **SVØ**WAE (132) of Rhodes, **UA**s 4KED **9VB Ø**KFG, **UC2**BB, **UR2**DX, VE8SA, **VK1**RG, **VPs** 2GL (218), 3YG 7BT 9EB, **VQ3**CF, **WH6**s DBF DEH DEP, **WL7**s CUW CUX CUY CUZ, **WP4**s ANH AOD AOX APR, **WW6**CW of Wake, **YO6**AW, **YU4**LL (105), **ZC4**IP, **ZD**s 1FG 2GUP (100) and **ZP9**AY.

10 phone fades to a feeble shadow of its former self as our hot months take over. But W1AYG, K1AOH (83/51), K2TBU, W3KKO*, K4s BYN QIJ, W5ERY, K5ABV, K8KHE, W**Ø**NGM*, CO2US, EL4A, GC2RS and KA2DE milk every opening that comes along for such hangers-on as **CE**s 3LT **ØZ**G, **CR**s 6CX 6CZ 6DU 7LU 9AI, **CT1**FM, **CX**6BA, **EA8**s CM CR, **FF8**GP, **FO8**AX, **FQ8**AF, **GD3**UB, **HC**1s AGI FG RY, **HH**s 1B 2OP 2W, **HK4**AQ, **HL9**KT, **HP1**AC, **KG4**AR, KH6JE/**KJ6**, **OA**s 4HK 7Q* (650), 9B, **OQ5**DQ, **PI**1VKL of Holland, **PJ**s 2CE 3AD, **SV1**AB (255), **TG9**TS, **TI2**s CAH WD, UA4KYA (255), **UB5**FG, **UR2**BU, VEs 3EDG/**SU** 6QG/**SU** 8CG, **VPs** 1BS 1DH 2DA 2LO 2LS (300) 19–20, 5AB (250), 9WB, **VQs** 2AW 8AD, **VR2**DA (250), **VU2**s CQ (300) 17, PS RM, **XW8**AL (250), **XZ2**SY (250), **YNs** 1CJ 1MN 4CF, **YS1**LA, **YU3**JN, YVs 3CB 4ED 5ABH, **ZB2**A, **ZD6**DT, **ZEs** 1JT 2JA 2KL, **ZP5**s CF MQ, **4X4**s KK LC, **9G1**CW and **9M2**GA (277).

10 c.w.'s QRJ causes K2UYG to inquire, "Who turned out the lights?" They do glimmer dimly, however, for Bill, K1DCL, K2TBU, W3KKO, K4DRO, K5JNY (K5ABV), W8CSK, K9JIN, CO2US and EL4A, thanks mainly to **CT2**AI, **DM**s 2ADJ 3KPN, **ET2**KY 21, **FO8**AC,



XZ2AD commenced his ham career 'way back in 1926 as 2AC, then signed VU2AC before obtaining his present call. Oung is managing director of American International Underwriters in Burma, home office New York, when not busily obliging the DX gang on 20-meter c.w. or s.s.b.

GB2SM only England, **HA**5s KAG KDF KFR, Swiss portable **HB**1s TI TL, IT1PA, **JA**1TQ, **KB6**BJ, **OQ**5EH, **PJ**3AG, **ST2**AR, **SV0**WC 17, UA4PA, **UB5**FG, **UR2**KAA, **VQ2**AB 17, **YN**1AFM, **YO**2CD and **4X4**JR.

40 c.w.'s difficulty stems from different secondary causes. Skip is long but static is high. Centrally situated K5JVF observes, "With warmer weather and earlier sunrise, no more JAs heard here for weeks. Europe still comes through on some evenings but they're working only the East Coast gang." Well, mostly, anyway. Dave, W3GYP, K5s ABV and JNY manage to corner candidates like **CN8**JE 8, **CO2**US, **EL4**A, **KG1**AQ, **KZ5**LP (147) 9, **OK1**FF 5, **PY**s 2BQ 7SR (2) 12, **TI2**PZ 5, **VE8**OM (4) 6, **VP9**s BO (8) 5, CR DU (5) 14 and G.

40 phone makes threatening gestures as a potentially potent A3 DX band. K3BVV, W8GKB and CO2US have been digging up stuff such as **G3**JAG, **I1**AIM, **JA6**BT* (201) 10, **KH6**AFS, **KL7**FLG, **KZ5**DL (296) 7, **OA7Q*** (295), **PY8**JG, **SM4**OL, W5CAZ/mm off VP2 and W9ZFZ/**KL7**. Not only that, EL4A picked out the s.s.b. of W2s BBD PRT, W4s ENO RVN, K5s MSN QBU and W9ADN in one brief sweep across the band.

40 Novice kilocycle combers KNs 4FMA 5QWR 8OOK ØRDA captured **CM2**VH, **CO6**CQ, **KP4**AOO, **WH6**s CRI and DEP eagerly . . . . . **EL4**A tells of his vigil on 7145 kc. in search of Novice QSOs around 0300 GMT. Mac says that WV2AVX, KNs 3GJQ 4CPJ 4FNI 8MEJ 8MEQ 8MXX 8NEC 9QEM and 9RGG lay solid 7-Mc. signals into Liberia.

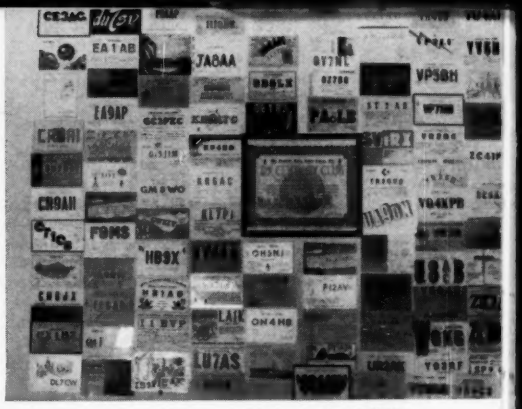
80 c.w. keeps its propagational foot in the "How's" door but it's a tight pinch. Ks 2DDK and 5JNY account for **JA3**JM (10), **KM6**BL (10) now QRT, **LA6**U, **OE1**PK, **PJ2**AE (22) 3 and **VP5**FP (5). As for **one-sixty**? No one brought the matter up so we couldn't vote on it.

Where:

Asia — Noting BV1US QSL considerations, WGDXC urges applicants to inscribe the pertinent BV1US operator's name on each card to expedite reply. The same goes for most multioperator stations . . . . . All the way from the *Malayan Radio Amateur* comes this comment: "The ARRL QSL Bureau reports that several packages of cards from overseas have arrived in poor condition, some with loose wrappings indicating that cards may have fallen out. It would be appreciated if societies would advise their QSL managers not only to wrap the packages securely but to indicate on the outside cover how many cards are contained in each package." The MARTS organ further observes, "Some amateurs have attempted to use the International Reply-Paid Postcards (provided for under Section 2, Article 52, of the Universal Postage Convention) to get QSLs from rare DX stations but have had only moderate results. Apparently some administrations are not aware of these cards, or refuse to accept them without additional local postage. Societies, especially in countries with limited numbers of amateurs, might wish to communicate with their postal authorities and attempt to secure recognition of these postals. It will save DX stations time and postage, and speed the highly sought-after cards to amateurs in countries with large amateur populations." . . . . . KA2DE mentions APO 994 as the Far East Amateur Radio League's new address . . . . . DXCSL's *Tip-Off* tips us off that W3CGS might be of assistance in running down elusive HL9KS pasteboards . . . . . Via W1VG from 9K2AN: "My good friend 9K2AP is trying to arrange a U.S. bureau for us. Meanwhile I am clearing all QSLs before proceeding on three months' leave."

Africa — Through W2RDD, EL4A designates Letourneau-Liberia, Roberts Field, Liberia, as sufficient address for any EL4 station . . . . . EL4A further declares, "Will operate as much as possible and really give W7PHO, who

Recent festivities at the Hong Kong Amateur Radio Transmitting Society brought out quite an assemblage of Asian DX and some XYLs to boot. The latter, front row from left to right, are the ladies of ex-C1C, VS6DK, member Drakeford, VS6CL, VS6BJ, VS6EA, member McNeill, VS6DS and member Wakeford. Second row: V. Barry, ex-C1C, VS6EA, VS1BB, L. Drakeford, VS6DU, VS6DK, VS6DO, CR9AK and VS6BJ. Rear: R. Harvey, CR9AI, VS6CI, J. McNeill, VS6CL, VS6AE, VS6AH, VS6DS, CR9AH, VS6DJ, members A. Lee and J. Wakeford. If you haven't logged one or more of those calls your skyhook has a deep null toward the Orient—or you just don't dig DX.



Our "How's" walls are graced by these "DXCC²" QSL collections (across the tops of this page and the next) of OH3RA, W6TPJ, W2YTH and TI2HP who were sufficiently intrigued by the gambit on page 59, April 1957 QST, to corral confirmations of QSOs with ARRL DX Century Club members in 100 or more DXCC countries. Another filing by W8UMR is not shown; in order of receipt, the depositions of W8UMR, TI2HP, OH3RA, W6TPJ and W2YTH are Nos. 9 through 13 in our DXCC² parade. Further discussion of this subject occurs in the month's introductory comments.

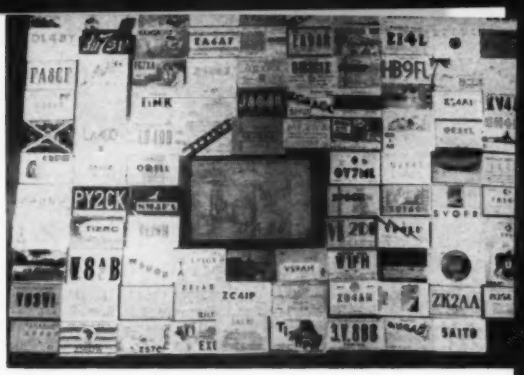
helps handle my QSLs, a good workout. Will QSL 100 per cent — even to Sixes!" . . . . . From W2CN: "I have resigned as QSL manager for [CR5AR] and QSLs should be mailed direct. . . . For your information, Ramalho filled in all cards himself. I did not do so since he never sent me logs. He would send me the completed QSLs for forwarding; thus many hams who sent me their cards never received QSLs. I have returned all cards to those who included s.a.e., and in the next few days will return many cards to hams who failed to include s.a.e. I suppose I should say that the business of being a QSL manager is one of those things called a 'labor or love.' The time it takes is absolutely unbelievable." . . . . . "Just a few lines to inform you that I am now handling QSLs for VQ-3GX," communicates K5BGB. "The usual self-addressed stamped envelope is necessary I receive the log over the air every Wednesday on 20-meter s.s.b." . . . . . Ex-9G1CW assures, "I will reply to any requests for QSLs which have not yet been supplied, from my new QTH in Switzerland." . . . . . "A policy of 100-per-cent QSL will be adhered to by ZE3JO/ZD6 and ZE8JJ/ZD6," pens W6UNP. "For W/Ks, s.a.s.e. to me will assure rapid reply." . . . . . KN1-IVT lauds thoughtful 5A5TO. "He places a piece of paper on the inside of each envelope, between gum and QSL, so you won't be afflicted with a blotched card." . . . . . Add OQ5IG (self-addressed stamped envelopes, please) to the list of QSL clients served by W2CTN which appears on page 74, May *QST* . . . . . CN8IF (K0PIV) endeavors to excavate deadwood at the Moroccan bureau, stating, "Former CN8s AI AP AS CL CT DA DC DH EB ED EG EH EI EJ EL EM EN EP EQ ER EU EZ FA FB FC FD FE FF FH FK FL FM FO FP FQ FR FS FT FU FV FW FX FZ GA GB GC GE GF GG GH GI GK GL GN GP GQ GS GU GV GW GY HA HB HD HE HG HI HJ HK HN HO HP HR HT HV HQ HX IA IB IG IH IL IM IN IO IP IQ IR IS IT IU IW JC JD JH JK JM JN JP JQ JV JX JY KL KP MC NN OU PK QW RA and YA who would like to receive old cards should send me self-addressed stamped envelopes and I will gladly forward the QSLs. Nicknames and tenures of license should also be specified, for there may be cards on hand for different operators under the same suffix. Approximately 300 cards are on hand for ex-CN8s, the number of cards for each operator varying from one to about twenty. Other DXers sending QSLs to CN8s who give QTH in the vicinity of Kenitra or Port Lyautey (actually one and the same place) will be much more sure of delivery by sending them to me." Jerry's current address follows . . . . . EA3IS and friends, intending Ifni operation this month, recommend EA3GF's address for QSL purposes, according to W2HMJ . . . . . W6UNP establishes that ZE3JO is the present QSL manager for ZE and ZD6.

Oceania — Regarding one FO8 who is notably tardy in QSL matters, W6PHF has this to say: "Like many people in his part of the world, when there seems very little urgency in an action he is likely to take his time. But during a visit with him last December I saw that he had a stack of 22 envelopes addressed to different QSL bureaus. He really always QSLs — but slowly." . . . . . "Cards for all KR6AK contacts made in the 1959 ARRL DX Contest were on their way by the 15th of May." KR6AK stresses the need to add six weeks transit time for sea mail to and from his part of the world so far as W/Ks are concerned . . . . . FK8AW and VK9GK join the mammoth W2CTN overseas bureau profusely aforementioned. Jack naturally reemphasizes the s.a.s.e. requirement. . . . . Via ARRL DXCC Deskman W1WPO from K4LNM: "I handle QSLs for ZL3DX's May DXpedition. He had planned to operate from ZM6 ZK2 VR2 and VR5 during his two-week trip to those areas." . . . . . "Many hams in the States send me QSLs accompanied by too much postage," laments YL K6QPG/KW6. "Rates are the same here as in the U.S.A. proper. Some include IRCs, too, which are inappropriate. My QSL backlog fluctuates around 400 — just can't keep 'current.' Incidentally, surface mail from the States takes from five to six weeks, while air mail arrives in three or four days. Two cents make *some* difference."

Europe — Ex-II1EZZ/M1 writes from DL4GX: "Hams could expedite their San Marino QSLs by submitting stamped self-addressed envelopes. QSLing after a DXpedition is a horrible chore. I've sent out 250 cards so far in my limited spare time." . . . . . Regarding May's squib anent philatelist UA4KAB op Perhutko (p. 74), G8PL much earlier dispatched a communication to the same address with no acknowledgment to date . . . . . "I've mailed about 200 GB3GD-bound QSLs to G3CQE for his April Isle of Man DXpedition and I expect him to mail them back to me any day now so I can fill up the s.a.s.e. and ship 'em out," writes K9ELT. "Very attractive scenic GB3GD QSLs will go forth." . . . . . *De gustibus non est disputandum*: G3CMJ informs ISWL's *Monitor* that he has no interest in QSL cards, and that he has instructed 'the QSL bureau' to destroy all cards received for him . . . . . WA2CCC understands that OK1HI does JT1AB QSL honors at the CAV bureau . . . . . VP9CR returns to Uncle Sugar this month and promises W1ZDP to have his logs with him. Evidently Ken's address (to follow) is to remain valid for forwarding. "Also, if anyone who worked DL4ON circa 1947–'49 still requires confirmation, I have those logs and will QSL upon request."

South America — W9WHM apprises, "I am the worldwide QSL manager for HK0AI for QSOs since April 1, 1959, but I may be able to help out on QSOs before that date. However, there are contest QSOs made from HK0AI by some of the KS4BB gang for which there are no records here or apparently at Vic's shack. W/Ks are requested to submit s.a.s.e.; foreign amateurs should include enough IRCs for air-mail reply." . . . . . W3GYP's card to last autumn's 40-meter PY0CB was bounced by LABRE like a marble off bathroom tile . . . . . "K1DRN henceforth will serve as my QSL manager for U.S. contacts," instructs FM7WQ. "It will be necessary to receive the customary self-addressed stamped envelopes from W/K stations for direct reply."

Hereabouts — HI8BE, who closed down last month, says, "Those who sent International Reply Coupons have received their QSLs direct, others via bureaus. All contacts still lacking cards should forward self-addressed U.S.-stamped envelopes to HI8BE, U.S. Embassy, Ciudad Trujillo, D. R." with full QSO data . . . . . TI2WD is another addition to W2CTN's QSL clearing-house, s.a.s.e. requisite . . . . . W8MXS undertakes the QSL chores of VP2KJ and, through W1WPO, calls for s.a.s.e. (W/Ks) or s.a.e. plus IRCs (foreign) . . . . . "I want to convey my thanks to you for mentioning my DX Stamp Service in your April column," writes W2SAW. "It brought many requests for the stamp lists and already a few of those are ordering stamps. The month of April has been my biggest month to date for stamp orders; this indicates it is catching on. Fellows using these stamps are most gracious in their praise of how well the response is on return QSLs. Only one catch — it's cutting into my DXing time. Hi!" W9-



DSO's able assistants at the ARRL W9/K9 QSL Bureau now include W9s ABI DXU GDI IBC PCF PVD QIY UIK RRX YGM and K9LSN. This team divides the alphabet between them and clears from 7000 to 10,000 inbound DX QSLs monthly. Obe comments on behalf of the gang, "Our committee likes to work DX, too, and the many hours they spend serving you have to come from on-the-air time. Please cooperate by keeping us supplied with envelopes — the right size, your call carefully shown, and bearing the correct postage." . . . . . K1DCL offers his good offices as QSL agency for a rare DX station in bona-fide need . . . . . Now let's see what's cookin' on the QTH front.

CE1TF, c/o ACMC, Potrerillos, Chile
CE0AE (via RCC)
CM2VH, Miguel Sacerio, San Lazaro 569, Havana, Cuba
CN8FJ, Box 2060, Casablanca, Morocco
CN8IF, G. L. Hale, Navy 214, Box 50, NCF (R), FPO, New York, N. Y.
CO2QH (to CM2QH)
ex-CP1AM, Maj. E. M. Downing, 304 Georgena Curve, Montgomery 5, Ala.
CR5AR, A. Ramalho, PTT, Sao Thome Island, P. W. A. (see preceding text)
CR10AD (via W7PHO)
CX2AX (via RCP)
CX2BT, Santiago Fabini, Box 37, Montevideo, Uruguay
DL4GX, Col. Guy M. Blencoe, Deputy Signal Officer, 7th U.S. Army, APO 46, New York, N. Y.
DL4LR, PFC R. L. Moss (W8FJR), 163 Oakridge Ave. E., Ferndale, Mich.
DL4MG, W. W. Adams (W5WW), Det. J2, Hq. USASA Eur., APO 277, New York, N. Y.
DL4RX, Lt. Col. H. Longerich, 318th USASA Bn., APO 66, New York, N. Y.
DU1PAR (via PARA)
EL4s D F J, Letourneau-Liberia, Roberts Field, Liberia
F2MB, Maurice Breil, 40 Rue Auguste-Comte, Talence nr. Bordeaux (Gironde), France
FB8CD, Andre Lienard, Ile Mayotte, Archipel des Comores, via Madagascar
FM7WQ (W/Ks via K1DRN)
FQ8AE, P. O. Box 467, Brazzaville, Fr. Equatorial Africa
FY7YF (via W2FXA)

Kuwait's lively DX contingent includes 9K2AN whose T-90, SX-101 and dipoles give an excellent accounting on several bands. Nasir's favorite haunt has been 21 Mc. but he also flirts with 20 and 40 meters on occasion. After return from leave in Pakistan 9K2AN intends to improve his skywire facilities. (Photo via W1VG)

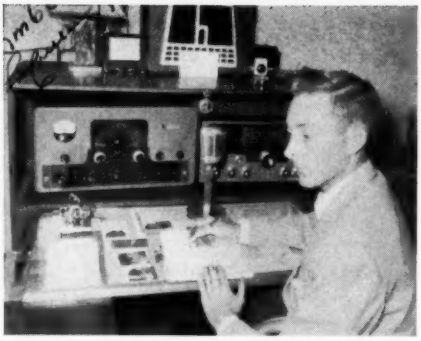
HA5s AM KAG, P. O. Box 185, Budapest 4, Hungary
HC1FG, Carlos Cordovez Borjia, P. O. Box 2799, Quito, Ecuador
HH9RE (to HH5RE)
HK3QV, P. O. Box 5954, Bogota, Colombia
HK0AI (via W9WHM)
HP1GA, P. O. Box 5310, Panama City, R. P.
HP1ME, M. Espinosa, P. O. Box 493, Panama City, R. P.
ex-IIEZZ/M1 (to DL4GX)
KC4USM (via W9HJM)
ex-KC6JC, J. A. Cavanagh, S.J., Woodstock College, Woodstock, Maryland
KH6BDV/KJ6, Weather Bureau, Box 22, APO 105, San Francisco, Calif.
KG1FN (to W1IJD)
KP4ARE, Casa WC-20, Los Angeles URB, San Juan, P. R.
KX6CN (via KX6AF)
LA3RL, O. Kjevik, Hommelvik, Norway
LU7ZD (via LU3HAK)
MP4BCN (via W2ZGB)
MP4s QAN TAD (to MP4BBW)
ex-OA4IQ (to OA7Q)
OA7Q, Msgr. Wm. Hayes, Chectuyoc, Cuzco, Peru
OK3EA, Dr. H. Cincura, Drotarska 383, Bratislava, Czechoslovakia
OQ5BC, N. Legrand, P. O. Box 1650, Jadotville, Belgian Congo
OQ5IG (via W2CTN)
OQ5IO, P. O. Box 55, Matadi, Belgian Congo
OQ0PD, Dr. Paul Duren, P. O. Box 110, Astrida, Ruanda-Urundi, Belgian Congo
PZ1MR (to VE3MR)
ex-SU1FX (to ZD2GUP)
TA3US, MARS, Halfsec, General Delivery, APO 224, New York, N. Y.
TI2WD, (via W2CTN)
UA6LI, Postbox 15, Rostov, U.S.S.R.
UB5WF, Box 41, Lvov, Ukrainian S.S.R.
VE2YX, T. Chryanowski, D.O.T., Indian House Lake, Quebec, c/o D.O.T. Agent, Goose Bay, Labrador
VE6QG/SU (via VE6EO)
VK4OL, 161 Raymont Rd., Alderley, Brisbane, Queensland, Australia
VK9GK (via W2CTN)
VK0TF (via VK3YS)
VP1DH, D. N. MacKay, Corozal Sugar Factory, Corozal P. O., British Honduras
VP2KJ (via W8MXS)
VP8JIL (via RSGB)
VP9CR, K. Harding, 1604th ABW (Hedron), APO 856, New York, N. Y.
VP9CX (via VP9BDA)
VP9ET, U. S. Naval Facility, Navy 138, FPO, New York, N. Y.
VQ3GX (via K5BGB)
VQ8AV, Vacoas, Mauritius
VR1B, c/o Wm. Storer, VK2EG, Lot 55, St. Charles St., French's Forest, N.S.W., Australia
VRs 2GC 5AC (via K4LNM)
ex-VS1BB, B. Bonser, c/o H. Goodwill, 4 Shawe Rd., Flixton, Manhester, England
ex-VS1FW-VS2FW (to G3MRC)
ex-VS1HQ (to G3LCS)
ex-VS2BA, E. Sugars, Casa Santa Clara, Calamares, Sinta, Portugal
ex-VS2ER (to DL2ER)
ex-VS2EZ (to G3MLM)
ex-VS2FF, A. Jeenes, RAF Stn., Boulmer, Almwick, Northumberland, England
VS5BY (via W6ZEN)
ex-VS5JA (to ZL4JA)
VU2NR, B. Raju, Civil Airforce, Hyderabad, India
VU2RJ, R. N. Ingle, Beam Wireless Stn., Poona 6, India
W2EPS/KJ6 (to W2EPS)
W9KLD/KL7 (to W9KLD)
XE0MPF (to W0MPF)

XE0QXK (to K6QXK)
YA1IW (to W6DXI)
YN1AFM, USAF Mission to Nicaragua, c/o U. S. Embassy, Managua, Nicaragua
YN1MN, P. O. Box 1344, Managua, Nicaragua
YV5ADZ, P. O. Box 1206, Caracas, Venezuela
ZB1FA, S/Sgt. R. Conway, ComCan Sig. Sqdn., Zonkor Det., Malta BAPO 51, Malta
ZC4CS (via RSGB)
ZC5BR, B. Riach, RAF Stn., Labuan, British No. Borneo
ZE8 3JO/ZD6 8JJ/ZD6 (W/Ks via W6UNP)
ZL3DX/ZK2 (via K4LNM)
ZM6AC (via K4LNM)
ex-3A2BN–F7ER, S/Sgt. A. L. Kemmesies, W4FOC, Co. C., 317th USASA Bn., Ft. Bragg, N. C.
3A2CK–DJ0AA–ON4IE/2–G3HEV/a, G. V. Haylock (G2DHV), 28 Longlands Rd., Sidcup, Kent, England
ex-4S7GS (to G3JGR)
9G1BA, Wm. Ashplant, c/o ISWL, 86 Barrenger Rd., London N.10, England
ex-9G1CW, Hans Suess, Au-Wildegg/Ag, Switzerland
9M2JF, 44 Northam Rd., Penang, Malaya

Three cheers and a tiger for W1s AYG HR UED VG ZDP, K1AOH, KN1IVT, W2s HMJ HWA MUM RDD, WA2CCC, K2s BMI SFA TBU UYG, W3VDV/8, K3BVV, K4s AW HRG PHY QIJ RJM TEA ZKZ, KN4FMA, W5ERY, K5s ABV BGB LGH, W6s JNX JQB KG NKR PHF UED, W7s MCK VCB, W8CSK, K8KHE, W9ZYD, W0NGM, CO2US, KA2DE, VE3EIL, A. Rugg, DX Club of St. Louis, Hamfesters Radio Club, International Short Wave League, Japan DX Radio Club, Malaya Amateur Radio Transmitting Society, Newark News Radio Club, Ohio Valley Amateur Radio Association, Austria's OVSV *OEM*, Holland's VERON *DXpress*, VP-DX Club of Massachusetts, West Gulf DX Club and Willamette Valley (Wash.-Ore.) DX Club for the preceding directory, each item of which, of course, is necessarily neither accurate nor "official".

Whence:

Asia — Tumbleweed W6PHF/mm (FO8AW) learns that ex-VS5JA (ZL4JA) expects to spend six months in Iran after a short holiday at his Dunedin home. "He will attempt to get on the air there but thinks that it may be difficult." (Not only that; Iran [EP-EQ prefix] is on that pesky ITU-FCC Ban List which appears on page 87 of last month's *QST*.) W1VG learns that DL7AH also is down that way. Good luck, lads, towards resurrecting a really rare area not heard from on DX bands since around 1950 . . . . . Ex-VS9MA-4S7DT now sports the call G3NJT back home. "I hope to return to the air and have decent rag chews with all those I had only fleeting words with from the Maldives." Don is good enough to permit the current Gan gang to continue receiving his monthly *QST* . . . . . F2ZB claimed to be ex-FI8AB in recent QSO with W8CSK . . . . . W6KG hears that XZ2AD will be visiting the U.S.A. soon with intentions of looking up some of his many on-the-air Yank acquaintances . . . . . K7ATU writes from the HL9KR proximity where duties at a remote beacon site preclude much hamming on his part. But Howard keeps an ear on proceedings with an SP-600 . . . . . Via W8KX we learn that VS1FZ (G2ATM) still searches for R. I. and W. Va. almost daily on 20 c.w. from 1000 to 1100 GMT . . . . . W6GFE celebrates a memorable tenth anniversary next month. 'Twas on the 11th of August, 1949, that Homer pulled a Tibetan triple play by working AC4s YN NC and RF in quick succession. He now holds pasteboards to prove it . . . . . "If U.S. hams are interested in skeds with India I shall y too pleased to open up from my end on 20 or 10 m. .s. My rig is a homebrew 65-watter, I us an SX-28 receiver, and half-wave doublet." That from Major K. E. Gillon, VU2CD, who also welcomes personal ham visits at T/10 Station Rd., Delhi Cantonment 10, India . . . . . KA2DE's first three months on 10, 15 and 20 netted him 58 countries. He's K5DED from our side . . . . . Bud of HZ1AB tells KN1IVT he has managed only three Novice QSOs in the past year because of hectoring by high-powered Generals. Bud's XYL is KN5SNQ . . . . . In lines to W1VG, 9K2AN weighs in his DX tally at 88 countries (66 on voice) and 33 States. WAC and WBE are in the bag. "I have been trying 7 Mc. lately and have worked a few Europeans and VU2JA. I hear W/Ks working Europe around zero hours GMT. On my return from Pakistan leave I'll try forty again to see if I can hook the U.S.A." . . . . . Club Orient addenda thanks to DXCSL and VERON: W8PVH's Pakistan hamming authorization materialized, call undisclosed at this writing. . . . II2FF tantalizes DX colleagues with hints of another Nepal activation in August. . . . CR9AH, roving as HB9QP/mm, panned to test his pile-up luck at CR8AC this summer. . . . YA1IW (W6DXI), with a fresh 11,000-ft.-high QTH in prospect, likes 21 Mc. as a rule with his G-66 and G-77 but also tries 14 and 28. KA2DE was elated to be YA1HW's first KA contact. Neighbor YA1PB, in a "can you top this?" move, is reported due for an ensconcement at the 13,000-foot level. Both expect to remain in Afghanistan for a few more months, joined by YA1TD. It's becoming positively *cluttered* over there . . . . . JDXRC's *Bulletin* bulletins attainment of the first JA 3.5-Mc. WAC by JA2JW.



KM6BL now returns to the States after some 10,000 Midway QSOs which qualified him for such honors as DXCC, WAS and WBE. KØGZN will accept correspondence for Mac until his next Navy QTH and Stateside call are ascertained. (Photo via W3ICQ)

Africa — ZEs 3JO and 8JJ anticipate six days of Nyasaland DXpeditionary doings near the end of this month. W6UNP is told they'll be running about 35 watts of c.w. on all favorable DX bands, and will answer calls on a 10-kc.-up-or-down basis. They may use their own calls with "/ZD6" appended . . . . . VE3EIL understands that VE6QG/8U will keep VE3EGD/8U company on Gaza Strip for some months to come. "Both use the same BC-610, so you won't hear them on the air simultaneously. VE6QG is a real DXer who spends many long hours chasing the stuff, while VE3EGD mainly handles phone schedules with Canada. It is unfair to call the latter during sked periods, generally between 0100 and 0630 GMT, but after that he takes on all comers." . . . . . K4HRG gives the SU1MS routine as 0500–0530 GMT on the low edge of 20 c.w., "usually 87 or better." . . . . . Ex-XW8AH (W8UTQ) writes, "Upon returning to the States from Laos I left again for thirty days in Tunisia, so mail has had quite a time catching up to me. I will return to 3V8-land in a few months." . . . . . "Those desirous of CN8 contacts should look around 28.8 Mc. just about any time that 10 is open and they'll find at least one of us up there," states CN8IF (K0PJV). "It's getting sort of rough on 28 Mc., though, so our activity probably will shift to 15 and 20 as soon as we rig appropriate antennas." . . . . . Reporting on his first few weeks of Liberia operation, EL4A (W7VCB) has this to say: "At Roberts Field we have EL4s A C F J and YL EL4D. Our rig is a BW-5100 and the receiver a 75A-4. Antennas are a 600-foot long-wire job, a shorter long-wire, a 15-meter K7GCO vertical

Only a DX enthusiast can fully appreciate this desolate view of ZK2AB, a picture taken shortly after a February hurricane devastated much of Niue Island. Surprisingly, the rig and receiver were found to be functional after the sun dried out a heavy residue of sea and rain water. But, in addition to other severe domestic and business losses, ZK2AB's logs, QSL records and radio library are a gummy shambles. W6ZEN and friends strive to assist him in his recovery from this disaster. Meanwhile, DXers awaiting overdue ZK2AB QSLs must remain patient.

and a 40-meter dipole. A 60-kw. generator supplies power but it's not too reliable. Our best areas are Africa, Europe, South America east of the Andes, and the U.S.A. east of the Rockies. The roughest hauls appear to be the northwest U.S.A. (my home) and the Pacific. Being the only licensed-Stateside ham here, I do all the c.w. work while the others work phone. Have about 70 countries in three weeks, KH6BLX completing a potential WAC." . . . . . W6JQB collided with EL5A out west. Cleo returns to Liberia with new Mohawk and Apache weapons.

Oceania — Mr. Hawaiian Ham Radio, KH6IJ, moved to Boston last month to attend Harvard under a National Science Foundation grant. "I will have an HT-32, 75A-4 and Mini-beam but big-time contesting will be a thing of the past." That may be temporarily true, but New England contest hounds had better keep Katashi under close surveillance . . . . . As you may already know, this year's World-Wide Boy Scout Jamboree takes place in the Philippines over the third week of this month. W6IWJ, KA2DE and DU1GF describe the installation of DU1PAR at the Jamboree site with a BC-610 and skywires for 10, 15 and 20 meters. Third-party traffic restrictions have been waived so that visiting scouts from overseas can dispatch hamgrams homeward. Special commemorative QSLs will follow . . . . . YL K6QPG/KW6 desires it clarified that the "R.N." after her name does not stand for Royal Navy. "From now till fall I'll be working mostly 20 c.w. with the beam pointed over the pole trying to work Europe. KW6CO has been transferred to North Carolina. Our only Novice, WW6CW, likes fifteen meters. I'll visit Japan, Hong Kong, Guam and Manila with the OM in June." Mary's "part-time" job at the Wake dispensary often comes to ten hours daily, a blow to her DX ambitions . . . . . From QSL-agency philanthropist W2CTN: "FK8AT is active again after a six-month silence while moving to a new New Caledonia location with his new DX-100." . . . . . Fruitful K2UYG research: "For those interested in hamming in Australia, if one holds an American amateur license one will have no trouble obtaining a New South Wales or Queensland license. Application should be made upon arrival to the Comptroller, Radio Branch, Postmaster General's Department, Treasury Gardens, Melbourne, Victoria, P.s.: Mains are 240 volts at 50 cycles." . . . . . WA6DFH/mm, chief radio officer aboard SS *Monterey*, still manages to hit 10 through 40 meters consistently. George also fires up in Tahiti as FO8AX now and then . . . . . W2EPS/KJ6 notifies W1WPO and K4QIJ of his return to Jersey from Johnston Isle. "Thanks to amateur radio, all of us at Johnston found just that little bit of morale boosted to much higher levels. I personally can never thank or repay in words such hams as Ws 1DFA 1RTI 2FY 2WCY and K5ODC/4, to name just a few." . . . . . "KM6BI celebrated its first anniversary in its Midway hangar on the 1st of April, but to people responsible for establishing the station it was no April Fool's joke. KM6BI is one of the biggest moral builders on the island, for amateur radio is the only means of direct contact with our folks in the States and elsewhere around the world, aside from the mail route." So reads a release by Navy YN1 C.W. Gaines of Airborne Barrier Service Squadron Two. KM6BI has a KWS-1, 75A-4 and triband beam often on 21,410 or 28,660 kc. between 0700 and 1600 GMT, Monday through Friday. KM6BP does much of the operating at the station, assisted by KM6s BH BJ BK BL BM BO, Ks 4PSJ 5OIT 8LYK, KH6s CTT CVH and W6WWL . . . . . K6YKT is having a DX romp at KG6AAY . . . . . ZL2GX informs us that the 1958 VK/ZL Contest (similar to our Canada-U.S.A. affair in concept) saw VKs 2ADE 6RU 9DB 2GW and 5NO take c.w. honors in that order for Australia, while ZLs 1AH 1AJU 4AT 1NG and 1MQ registered New Zealand code highs. On phone the sequence is VKs 6RU 3HW 2ADE and 2AHH, ZLs 1MQ 2RT and 4BO . . . . . Pacific pointers by way of DXCSL and VERON: Consult ZL2GX for advice if you still need Lord Howe and/or the Chathams. . . . Canton's KB6s BK CB and CL are often raisable on the high end of 15 phone.

Europe — Curtain comment from the mills of Ks 3CUI 9EAB, Ws 3GYP and 0DEI: Russia's "central committee" has established a certification available world wide for the QSOing of 100 U.S.S.R. stations in 1959. This coincides with centennial observance of the birth of Aleksandr Popov, radio pioneer. Special jubilee stamps, envelopes and QSLs are in the works. . . . UC2DX is reported QRT by official request. . . . K9EAB received his R6K diploma, a U.S.S.R. award similar to IARU's WAC, earned by collecting and submitting QSLs from all continents plus one card each from European and Asiatic Russia, eight in all. RAEM tells Cliff that a Russian ham callbook soon will be published. . . . UQ2AN prowls the vicinity of 14,010 kc. daily from 0300 to 0700 GMT in hopes of landing Nevada for WAS . . . . . SM1BVG will offer Gotland Island to WASM-seekers until the 20th of August on 14,050 kc. daily around 2300 GMT. Bjorn also will try 15 meters and 14,150-kc. phone at times . . . . . ON4NC, at the 249/236 mark, desires whereabouts hints on EQs 1RX and 2L (1948), PK6EE ('47), W4s BOW/Iwo ('47) and FVI/KX6 ('48). Christian is pleased with his new triband beam . . . . . W1JTD writes W1BDI about an imminent DXcursion to Ailsa Craig Island (Paddy's Milestone) by GM3s ITN KBZ and LYS. "It's a big rock 100 feet high with a lighthouse and small fishing village. They hope to use power from the lighthouse to run the gear and will use the call GB2AC." Which brings up an old intriguing question: What's the visual DX record for lighthouses? . . . . . Thanks to agitation by GC3LXK, GC2RS admits to a nibble by the sideband bug. Frank's new 45-ft.-high rotary dipole performs well on 15 phone . . . . . KN1IVT advises that one of the world's rarest Novices, 8V0WAE, should be back in New Orleans from Rhodes by now . . . . . K2TBU finds club-collective station HA5KAG quite ubiquitous with 100 watts and a 9-tube super . . . . . K2UYG logged indications that SM5WN/LA/p's Svalbard sojourn is drawing to a close. And W5PSB noted Ivar's recent activities being curtailed by depletion of fuel supplies . . . . . Lt. Col. Harry Longerich, who played a supporting role in our December 1954 Pearl Harbor yarn, turns up again as DL4RX with an HT-30-31, SX-100 and much determination to strafe the 14.3-Mc. s.s.b. battleground . . . . . F2MB, whose QTH shows in "Where", is contest manager for the Bordeaux Wine Test mentioned briefly last month . . . . . "I recently received the REF DUF-4 award for phone, certificate No. 393," records W6OBH. "I'm happy to say that my coveted QSLs received careful and expeditious handling." For which F9IL must take a bow . . . . . News from famous APO 84 via F7CV: "I'm still looking for those elusive W7/K7s. . . . A new Stateside call among us is WA6BXJ, our chief MARS op, who was recently involved in an incident in which he relayed the information necessary to save a ship in danger. Ray now anxiously awaits his F7 suffix. . . . F7FO has his WAC credentials and is hot after WAS and DXCC before returning to W5WNF." . . . . . W1YIS finds SP3DG very interested in obtaining circuitry for electronic keys of the transistor breed . . . . . K2UYG latched onto the Radio Sophia ham program briefed on p. 77, April *QST*, and found the content mainly devoted to the local LZ scene . . . . . DL4MG (W5WW) fired up in mid-February and avers, "It has been a revelation to me, the DX I've been able to work with less than 100 watts to a simple long-wire antenna on 14 and 28 Mc. So far I have 70 countries and 40 States." . . . . . DL4GX reflects on his March II6ZZ/M1 sortie: "I was set up in a fine hotel near the top of the rocky little republic with a 3-element beam for 10 and a dipole on 20. Conditions were such that I could work nearly around the clock. From my opening call I was besieged with answers and managed to work nearly 450 stations." . . . . . Finland's SRAL announces the 1st Scandinavian Activity Contest, a world-wide DX affair scheduled for September 19th-20th (c.w.) and 26th-27th (phone). The rest of the world will seek to work OH OX OY OZ LA and SM-SL brethren on 80 through 10 meters. Sounds interesting; we'll go into more detail in September's "How's" . . . . . Check with ARI, Viale Vitorio Veneto 12, Milan, Italy, for recent rules revisions if you're interested in that society's CDM (Certificato del Mediterraneo) diploma. Also, ARI's Genoa chapter invites inquiries and rules requests concerning its 3rd Columbus Marathon slated for world-wide consumption from the 3rd of August to October 12th, the objective for non-Italian stations being to work as many I-lads as possible . . . . . More European items courtesy DXCSL and WG-DXC: That much-heralded Czech geographic expedition got under way in mid-May with the appearance of OK7ZH/ZA on c.w. and sideband. . . . The second week of August may see Alands action by OH3AB/OH0 and OH3QC/OH0 as operated by OH3QC and XYL OH3ND. . . . 'Tis whispered that DLs 1KB 9PF and DJ2MN prepare for Andorra efforts around the latter part of this month. K0IFL, serving Uncle Sam in Germany, also is in a PX-type mood. . . . How juicy can one DX call get? HV1CN and I1ZFF are game to activate HV1CN/M1 at any time now. . . . UA1-CK purportedly prepares Franz Josef Land emanations for this month and/or next on several bands. . . . K6NCG ships out for a tour of Azores duty. . . . SV0WB expects to remain at Rhodes for eight more months and is determined to raise his code speed for more c.w. fun.

South America — Ws 1AYG and 0NGM chorus info that former OA4IQ now signs rarer OA7Q near historic Cuzco. Msgr. Bill uses an HT-32, SX-101 and Mosley tribander with s.s.b. on such frequencies as 7295, 14,297, 21,425 and 28,650 kc. Idaho, N. Mex. and Wyo. would complete a fast OA7Q WAS . . . . . "I have not been very active for the past two years because of continuous traveling around Bolivia," writes CP5EK to W1WPO. "I close my station now after thirteen years in this country and will return to Chile where I hope to be active soon." . . . . . Curious VP8JIL pounds into K4QIJ's bailiwick with phone and c.w. on 14,100 kc. around 2200 GMT. K4QIJ expects to score a few transbeverage QSOs with European amateurs while visiting the Continent this summer . . . . . W9EVI, still leveling out after his Serrana swoop, is interested in Malpelo island propagational possibilities. The place lies off Buenaventura, Colombia . . . . . VERON's *DXpress* records that VE3MR tried his s.s.b. hand at FY7YF in May after a PZ1MR session of the same.

Hereabouts — W7FZA gives preliminary word on the 4th Annual Northwest DX Get-Together sponsored by the Vancouver, Seattle and Willamette Valley DX Clubs, to be held on the 22nd-23rd of next month at Portland's Mallory

(*Continued on page 144*)

The World Above 50 Mc.

CONDUCTED BY EDWARD P. TILTON,* W1HDQ

THAT we have enjoyed a big increase in v.h.f. activity in recent years is hardly news to anyone, but the timing and distribution of that growth are worth a little study. Ham radio being the random game it is, we find it difficult to count noses accurately, but relative figures can be drawn from several sources. One such source of information as to what has been going on in the world above 50 Mc. is the ARRL V.H.F. Sweepstakes, since it has been running for 12 years, with substantially the same rules. Participation in it is a matter of record, spelled out in the pages of *QST* since 1948.

This information, shown here in graph form, tells us a number of interesting things. We see at once that since about 1953 v.h.f. activity has risen steeply, after having rolled along showing no large trends up or down for five years. Let's look at the top curve (total number of entries) first. Here we see v.h.f. activity hitting bottom in 1951. Other forms of hamming were doing the same thing, and fellows who were around the ham bands in those days know why. TVI had many of us on the run. People were saying that ham radio was done. We might as well give up. Television interference was a problem beyond any practical solution.

These prophets of doom did not reckon with the resourcefulness and courage of most hams. After much hard work and not a little strife, solutions were found. Far from dying, amateur radio moved into the greatest period of expansion in its 50-year life. V.h.f. men were in the forefront of this drive forward. Between 1953 and 1955, participation in the V.H.F. SS more than doubled. Examination of the band-use curves shows that this was 2-meter growth only, however. Less than 100 stations reported use of 50 Mc. in each of the contests between 1950 and 1955, while 2-meter entries rose to over 700.

Much of the steep rise in the 2-meter curve can be attributed to the influx of Novice Class licensees. Not that all this new activity was by beginners; rather, having the beginners in there was making it more fun for everyone. Novices who graduated to General Class tended to stay on 2, finding it still more fun when they were able to operate on any frequency by any mode, and without the 75-watt power limit. There was plenty of cheap surplus gear for use on 144 Mc., too, and commercial equipment for that band began to appear in some quantities.

The 6-meter man, on the other hand, had little of either surplus or commercial equipment at his disposal. What was more discouraging, he had the toughest TVI problem of all facing him: adjacent-channel interference in Channel 2. Die-hard 50-Mc. enthusiasts, a breed apart, hung on tenaciously in their pet territory, but found it hard to attract many newcomers.

Then see what happened after 1955. That April, FCC opened 50-Mc. to Technician Class licensees, with ARRL's blessing. Six-meter occupancy increased fourfold in 1956, and from 1955 to 1959 it jumped by a factor of ten. Never has it been better demonstrated that there is nothing like activity to breed more activity! So much so that the 2-meter band lost some ground, though by no means so severely as some would have you think. But it is plain that the two band curves crossed in 1957, with 2-meter activity moving a little in the wrong direction.

*V.H.F. Editor, *QST*.

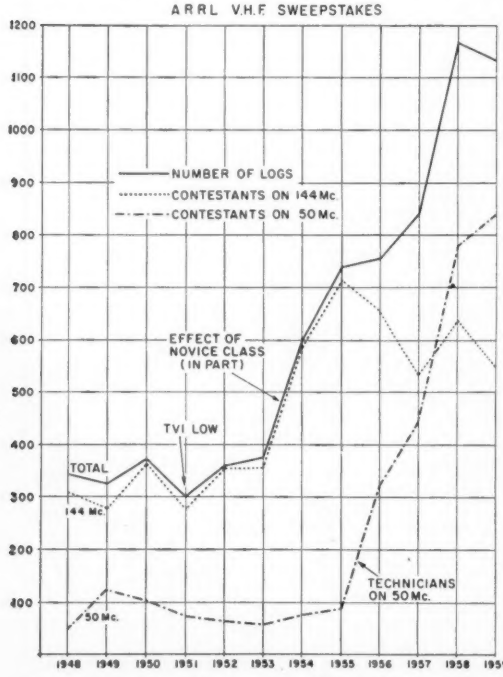


Fig. 1—Statistics from 12 years of the ARRL V.H.F. Sweepstakes.

So much for the past. How about the future?

Presumably the drop in the 2-meter curve after 1955 is the principal reason for the widespread support of the FCC proposal to open the 144-Mc. band to Technicians that has come from outside the Technician ranks. There is little doubt that this move, when and if made by FCC, will bring the 2-meter curve back up in short order. But what effect will it have on the future of the 50-Mc. band? And on 220, 420, and the still higher bands, all of which have experienced some new growth as the result of the Technician boom? Will the Technicians, whose enthusiasm has done so much for 50 Mc., now quickly swing to 144? Especially with the best of the worldwide 6-meter DX now history? It will take a close watch on more than the 2-meter activity curve to tell whether or not opening that band to Technicians was a smart move.

The Technician can demonstrate his worth to amateur radio by keeping the 50-Mc. band active and interesting, and by helping to populate the higher frequencies, even when the privilege of operating on 144 Mc. becomes available to him. If a chart like the one reproduced here shows rising curves for all bands above 50 Mc. five years hence, and the *character* of this occupancy has not entirely degenerated into party-line type yakking, then opening the world above 50 Mc. completely to the Technician may not have been too bad an idea.

Here and There on the V.H.F. Bands

In this space in June *QST* we said that 50-Mc. DX was light in April. This was true for most U. S. stations, but when the PRP logs began to come in from the rest of the world we had to revise our estimates somewhat. South and Central America, Australia, Japan, the Hawaiian Islands, and other areas of the world favored with *TE* propagation, were still doing well. LU2FAO, for example, had 16 countries on his April report. ZE2JV, Southern Rhodesia, continued his crossband work with ZC4WR, Cyprus, almost daily. He checked the m.u.f. at over 70 Mc. on several days, and on the 25th it went over his upper limit of tuning range, 75 Mc.! XE1GE, near Mexico City, worked South Americans every day in April except the 3rd, when he was not on the air.

The Japan-to-Australia path was open daily, as evidenced by many logs from both ends of the circuit. VK4NG used 14 report form sides for his April log. VK3ALZ reported a Mexican f.m. signal on 50.5 Mc. in almost daily for three weeks, up through early May. VK9XK, Port Moresby, Papua, worked KH6 and JA regularly, and less often KR6AK, Okinawa, and VS6CJ, Hong Kong. VS6CJ had KR6AK VU2RM VK4ZBE DU1GF W6KUY/mm, near the Philippines, and VK9XK on his list, which ended with the plaintive comment, "Why don't the VKs use c.w. more?" Out there, too?

KH6CTC, Kailua, Hawaii, says that the band was open for VK4s or VK9XK about every night up to May 12, but nothing has been heard since. Esther reports that she and the OM, KH6CHI, will shortly be packing up for a move to Chicago. Once settled they'll be back in business on 6, probably with high power for scatter work. Best day in Esther's 50-Mc. experience was Nov. 24, when she worked 47 stations in 22 states and all ten call areas.

From Switzerland, HB9QQ reports reception of several ZEs, ZS3G and ZS6AKI during March and April, his last reported date for this being April 29. On May 2 he heard a strong signal on 49.7 Mc. on a NNE heading. This and other signals in a similar direction were heard often last year.

U. S. 50-Mc. men missed a chance for interesting DX May 7, when KG1FN, on Fletcher's Ice Island, heard signals on the low end of the band for the first time since they set up in their far-north spot in April. Signals were weak and unidentifiable on voice, but they were spotted at 50.05, 50.1 and 50.11. Reception time: 2025 to 2050 PST. KG1FN is operated by W1IJD and W1WFJ, hourly whenever time permits, 0900 to 2200 PST, on 50.04 Mc. They have a good setup, and are determined to work some 50-Mc. DX. They can be reached quickly through far-north traffic man W9NZZ.

How far north does sporadic-*E* skip go? To our knowledge, no KL7 has ever worked out on 50 Mc. except by F_2 skip. At least one Alaskan station was on 6 in 1947, and he worked many Ws in the couple of openings he caught in November of that year. Nothing more was heard from Alaska on 6 until F_2 blossomed forth again in the fall of 1957, but then there was plenty. Numerous KL7s did a fine job during the F_2 DX of 1957, '58 and early '59 — but what happens to them in May, June and July, when sporadic-*E* skip comes along? Several have said that they hear nothing from the other 48 states in summer, but we find it hard to believe that E_s skip cannot reach there. Rather, we'd prefer to think that distances and activity distribution are responsible.

Anchorage to Seattle is about 1400 miles, near the limit of single-hop sporadic-*E* skip, and these are about the closest activity concentrations in W and KL7. Could be that working E_s from Alaska will take a lot of careful band-watching and frequent calling, at both ends of the circuit, but it should be possible. Here is a new convert willing to help. KL7CUR bit his fingernails last December, listening to Ws working KL7AUV on 6. He now has a converted Ranger on 6 and is ready to go. His location: Glenallen, 187 miles northeast of Anchorage, but about the same distance as the capital from our northwestern cities.

Though it may be a bit late for the present, here's a fellow who would like to work some Ws — and we're sure that any U. S. 50-Mc. man would be happy to work him. VU2RM is probably the only Indian amateur to have worked an appreciable amount of 50-Mc. DX. He says the band appears to open between 1300 and 1500 GMT, which just might make him a "possible" from Northeastern U.S.A., if conditions come back well in the fall. His address: S. Ramamhan Rao, 18/188 Kaspa St., Rajahmundry, India.

The last reports we have of intercontinental DX from Mainland U. S. A. are for the period ending May 7. K6GOX, Fresno, worked LU9MA at 1810 PST that night, and fellow townsman W6BJI heard LUs at about this time on the 6th. W6BJI was surprised to work ZL2ABX on May 1, 1315 PST. This was nearly two weeks later than the last ZL signals were heard last year. This pattern showed in Southern Florida, too. W4FNR, Ft. Lauderdale, worked ZL2DS and heard ZL2IBX on April 25. The only ZL work from that area previously was by W4CQP, March 31, 1958.

Here's another new country, due to be available on 6. YJ1DL (ex-ZC3AB-VK4DL-VK2DE) Espiritu Santo, New Hebrides, has been on the lower bands long enough to have become thoroughly fed up with the endless round of "RST 579 PSE QSL" and he thinks it is time to do something interesting for a change. He was talking about using 51.5 Mc., because he happened to have a crystal for that spot,

50 Mc. WAS

1	W0ZJB	17	W0OGW	33	W0PFP	49	W0FKY
2	W0BJV	18	W7ERA	34	W6BJI*	50	W8LPD
3	W0CJS	19	W3OJU	35	W2MEU	51	W0ZTW
4	W5AJG	20	W6TMI*	36	W1CLS	52	W6GCG
5	W9ZHL	21	K6EDX	37	W6PUZ	53	W2RGV
6	W9OCA	22	W5SFW*	38	W7ILL	54	W1DEI
7	W6OB	23	W0ORE	39	W0DDX	55	W1HOY
8	W0INI	24	W9ALU	40	W0DO	56	W6ANN
9	W1HDQ	25	W8CMS*	41	K9DXT	57	W1SUZ
10	W5MJD	26	W0MVG	42	W6ABN	58	W1AEP*
11	W2IDZ	27	W0CNM	43	W6BAZ	59	W5LFH
12	W1LLL	28	W1VNH	44	VE3AET	60	W6NLZ
13	W0DZM	29	W0OLT	45	W9JFP	61	W7MAH
14	W0HVW	30	W7HEA	46	W0QIN	62	W8ESZ
15	W0WKB	31	K0GQG	47	W0WWN	63	W2BYM
16	W0SMJ	32	W7FFE	48	K9ETD	64	W7ACD

*49

VE7CN	45	XE1GE	30	LU9MA	26	LA7Y	20
KL7AUV	44	KH6CTC	30	ZS3G	26	VQ2PL	18
VE1EF	42	SM7ZN	29	CT1CO	24	JA8AO	18
VE2AOM	38	PZ1AE	28	SM6ANR	24	JA8BU	17
KH6UK	37	SM6BTT	28	CO6WW	21	JA1AAT	17
EI2W	37	CO2ZX	27	LA9T	21	JA1AUH	16
VE4HS	41	ZE2JV	26	SM5CHH	20	ZE2JV	12

but we attempted to talk him out of that, at least for part of his operating, anyway!

All the interesting things that happen in a given month seem to come in the last few days — immediately after copy for this section of *QST* is sent to the printer. April was no exception. Here is some 144-Mc. news too good to pass up, simply because it will be a month older than we normally run when it appears in print. W5KTD, Shreveport, La., says that the band was quiet there all winter, but it broke open with a bang on April 26. At 0710 CST, Martin worked W5LID, Odessa, Texas, 510 miles to the west. At 0819, W5PZ, Ponca City, Okla., about the same distance to the northwest, was worked, both stations having S8 signals.

That night things were good to the east, and stations in the Shreveport area and over in Dallas, 200 miles to the west, worked W4TLV, Demopolis, Ala. The opening spread farther east on the 27th, and at 2047 W5KTD worked W4GJO, Sarasota, Fla., 760 miles, with S9 phone signals. W4TKE, Gainesville, 710 miles, and W4RMU, Jacksonville, 760 miles, followed soon after, on c.w. The Florida signals ranged from S7 to 40 over 9, from 2045 to after midnight, when all hands finally gave up. Stations in Texas and Oklahoma were alerted, but the opening did not extend to them.

This was W4RMU's first experience with such signals from distances of this order. He learned about the opening in a way that might be helpful to others. At about 2030 EST on the 27th, Allen started to hear aircraft working the New Orleans Center on 124.7 Mc. One was heard after being only a couple of minutes airborne. With planes using low-gain antennas, this could mean only one thing: propagation in the v.h.f. range was hot. W4RMU passes along a few departure control frequencies, in case you'd like to put a fixed-frequency converter on one or more of them: Washington — 125.1 Mc. Jacksonville — 124.9. Atlanta — 119.3. New Orleans — 121.1. Miami — 118.1. At 300 miles or more, any of these would make a fine indicator of improved tropospheric propagation.

W4IHHK, Collierville, Tenn., was in on these sessions, and one on the night of the 24th. Paul worked W5PCJ and W5DCV, Austin, 580 miles, K5AKA, Taylor, 540 miles, and W5AJG, Dallas, 440 miles. The s.s.b. signals of W5PCJ and W5AJG were outstanding. W4HHK thinks his antenna may hold some sort of endurance record. A 32-element homebuilt job, 85 feet in the air, it has been going strong for six years. Certainly it has played a major part in about as many "firsts" as any 144-Mc. beam we know of.

Clubs and Nets

The National Capital V.H.F. Society, Washington, D. C., runs a net on 50.4 Mc. each Tuesday at 2000. Latest club news and ARRL bulletins are transmitted by W3AHQ each Tuesday and Friday night, at 2030 on 50.4 Mc. and 2100 on 145.3 Mc. This club has made a practice of tape recording its speakers. These tapes and others made at the National ARRL Convention last summer are available to v.h.f. groups on a swap basis.

The Channel A Society, a 6-meter group extending presently from Connecticut to Pennsylvania, meets informally on 50.25 Mc. (Everybody has one of those 8375 crystals!) If you can work 'em you can join 'em. Three contacts with Channel A stations, and you're in, provided you send a list of the stations and times to K2REH, 814 Nicholas Place, Rahway, N. J. Certificates are available at 20 cents, to cover printing and mailing costs. K2ZSQ, who supplied this info, also has a list of TV distributors that supply TV filters, and forms for obtaining same. The list and four forms will be sent upon receipt of 25 cents by K2ZSQ, 67 Russell Ave., Rahway.

The Society publishes *QSO*, a 6-meter news bulletin. FCC releases, DX notes, write-ups of well-known 6-meter stations, ARRL news and other matters are covered. Subscription rate: $2.40 per year, for 26 issues, or 10 cents a copy, from K2ZSQ.

The Mobile Amateur Communications System was formed recently in the Seattle area, according to W7YKA. They specialize in reliable v.h.f. communication with 2-meter f.m. gear. Meetings are held the fourth Sunday of each month, at 1900. More information from W7YKA, 9201 36th Ave. South, Seattle, Wash.

The annual Turkey Run V.H.F. Picnic will be held July 26, at the Turkey Run State Park, on Highway 41, north of Terre Haute, Ind., July 26. This has come to be something of a national convention of v.h.f. enthusiasts over the years. In 1958 247 hams from 15 states showed up. Sponsor: Wabash Valley Amateur Radio Club. Information from W9KT.

2-METER STANDINGS

Figures are states, U.S. call areas, and mileage to most distant station worked.

W1REZ	30	8	1175	W5NDE	11	5	625
W1AZK	24	7	1205	W5VY	10	3	1200
W1KCS	24	7	1150	W5SWV	10	3	600
W1RFU	23	7	1120				
W1AJR	23	7	1130	W6NLZ	12	5	2540
W1HDQ	20	6	1020	W6WSQ	12	5	1390
W1MMN	20	6	900	W6DNG	9	5	1040
W1IZY	19	6	875	W6AJF	6	3	800
K1CRQ	18	6	800	W6ZL	5	3	1400
W1AFO	17	6	920	W6MMU	3	2	950
W1ZJQ	17	6	860				
W1CLH	17	5	450	W7VMP	15	5	1280
				W7JRG	10	4	1040
W2NLY	37	8	1390	W7LHL	4	2	1050
W2CXY	37	8	1360	W7JIP	4	2	900
W2ORI	37	8	1250	W7JU	4	2	353
K2GQI	30	8	1200				
W2AZL	29	8	1050	W8KAY	38	8	1020
W2BLV	27	8	1020	W8WXV	35	8	1200
K2IEJ	25	7	1060	W8PT	34	8	985
W2AMJ	25	6	960	W8LOF	33	8	1060
W2DWJ	23	6	860	W8RMH	32	8	910
K2HOD	23	7	950	W8SVI	30	8	1080
W2PAU	23	6	753	W8SFG	30	8	1000
W2SMX	22	6	940	W8LPD	29	8	850
K2CEH	22	8	910	W8EHW	28	8	860
W2LWI	21	6	700	W8WRN	28	8	680
W2RXG	20	6	700	W8BAX	27	8	960
W2UTH	19	7	880	W8DX	26	8	720
W2RGV	19	6	720	W8ILC	25	8	800
W2WZR	18	7	1040	W8JWV	25	8	940
W2ESK	18	5	850	W8GFN	23	8	540
K2RLG	17	6	980	W8NOH	21	8	975
				W8LCY	21	7	610
W3RUE	30	8	975	W8BLN	21	7	610
W3GKP	29	8	1020	K8AXU	19	6	750
W3KDA	28	8	1110	W8GTK	18	7	550
W3TDF	28	8	915				
W3SGA	26	7	700	W9KLR	41	9	1160
W3EPH	22	8	1000	W9WOK	40	9	1150
W3BYF	22	6	660	W9GAB	33	9	1075
W3NKM	20	7	730	W9AAG	32	8	1050
W3LNA	20	7	720	W9REM	31	8	850
W3LZD	20	7	650	W9ZIH	30	8	830
				W9LVC	27	8	950
W4HJQ	38	8	1150	W9EQC	26	8	820
W4HHK	35	9	1280	W9ZHL	25	8	700
W4ZXI	34	8	950	W9BPV	25	7	1030
W4AO	30	8	1120	K9AQP	24	7	900
W4MKJ	28	8	850	W9PBP	24	8	820
W4UMF	28	8	1110	W9LF	22	7	825
W4VLA	26	8	1000	W9KPS	22	7	690
W4EQM	25	8	1040	W9PMN	19	6	800
W4WNH	24	8	850	W9ALU	18	7	800
W4JCJ	23	6	725	W9CUX	18	7	800
K4EUS	23	6	765				
W4VVE	21	6	720	WØSMJ	29	9	1075
W4IKZ	20	6	720	KØEMQ	29	7	1110
W4OLK	20	6	720	WØIHD	27	7	890
W4AIB	19	7	840	WØBFB	27	8	1060
W4CPZ	18	6	650	WØGUD	25	7	1065
W4TLV	18	7	1000	WØRUF	23	7	900
W4BFR	18	7	820	WØQDH	22	8	1240
W4MDA	17	6	750	WØINI	21	6	830
K4YUX	16	8	830	WØUOP	21	7	900
W4LNG	15	6	1080	WØTGC	21	7	875
W4RMU	14	6	920	WØRYG	18	8	925
				WØIFS	16	6	1100
W5RCI	34	9	1215	WØIC	13	6	1240
W5DFU	25	9	1300				
W5LPG	25	7	1000	VE3DIR	28	8	1100
W5AJG	23	8	1360	VE3AIB	26	8	910
W5KTD	23	8	1200	VE3BQN	19	7	790
W5JWL	21	7	1150	VE3AQG	17	7	800
W5PZ	16	8	1300	VE3DER	16	7	820
W5VKH	15	5	720	VE3AOK	13	5	550
W5ML	15	5	700	VE3BPB	14	6	715
W5SFC	12	5	1390	VE7FJ	2	1	365
W5HEZ	12	5	1250				
W5CVW	11	5	1180	KH6UK	1	2	2540

The World Above 220 Mc.

Most of the information on variable-reactance amplifiers for amateur use thus far published has dealt with 144 Mc. The startling noise figures obtainable with these new devices do not really pay off until we go to higher frequencies, where external noise is less of a factor in weak-signal reception. Such noise drops rapidly above 150 Mc., so even at 220 Mc. the new amplifier should really make a difference. W6NLZ, Palos Verdes Estates, Cal., is using one on 220, and he reports a noise figure under 1 db. The pump frequency is approximately 1200 Mc. Just how much better this is than previous receivers at W6NLZ, or how much it pays off, we do not know, but John is doing well with W6FZA regularly on 222 Mc. Palos Verdes to Porterville is a 160-mile path over mountainous terrain. W6NLZ has also

worked W7LEE, Parker, Ariz. Signals were good over this rough 240-mile path, but with more fading than on 144 Mc.

Note that the middle of the band is used for DX tests in Southern California. This is to avoid the clutter of TV oscillator signals often encountered in the Los Angeles area. W6FZA is on 221.68 Mc., and is active each Monday at 2100 PDST. Polarization is horizontal.

We made a slight slip of the typewriter in giving details of the 220-Mc. Inter County Net in May *QST*, p. 190. Net Manager is K6GKX. We put Ralph in New England, typographically.

How much signal is needed for usable TV signals, compared to the level that provides readable voice? Experience at W8JLQ, Toledo, Ohio, indicates a difference of the order of 24 db. A signal that is a legitimate S5 on voice, if changed to video and properly modulated, produces a raster that will just sync in, but shows no picture detail. A 3-db. increase makes call letters just visible in the snow. S6 (on a 6-db.-per-S-unit scale) gives clearly readable letters, but still without viewing quality. An S7 signal gets rid of most of the snow, but it takes S9 signals or better to handle live camera stuff with good quality. W8DX and W8RLT, of the Detroit area some 55 to 60 miles distant, put that kind of signal into Toledo most of the time.

Not all the effort of these stations, and others in Ohio and Michigan we've mentioned recently, is devoted to TV. Quite a few of them operate only on 432 Mc., and are active nightly, with good gear and antennas. They hope to have some chances to work real DX on 432 Mc., phone or c.w., during the favorable propagation conditions this summer and fall. Don't look for them on a lower band to arrange a schedule. Get on 432 and bang away!

Two prospects: W4HHK, Collierville, Tenn., with a 64-element array at 60 feet, and W5KTD, Shreveport, La., with 104 elements. Both stations have high-efficiency amplifiers, at 50 watts input.

The pictures we ran in April *QST* of amateur TV stations W8DMR and W8RRJ brought several inquiries as to the nature of the equipment used. W8RRJ obliges with the following: For live pickup a camera schematically similar to the DAGE 60B is used. A flying-spot scanner system was built using a Philco projection chassis, a 5BNP16 scanner tube, photomultiplier and conventional video amplifiers. The r.f. section of the rig is a slight modification of the one described by W1VLH in *QST* for February, 1957, using a 4X250B in the final. The transmitter is grid-modulated by a video amplifier with cathode-follower output. For receiving a u.h.f. converter with a 417A amplifier is used with a standard TV set. The antenna is a pair of 13-element Yagis stacked. John's video DX is W8HCC, Sandusky, Ohio, 97 miles.

All these fellows would like to hear about what is being done with amateur TV in other areas. If you are *on the air* with TV, let's have the story. No closed-circuit or expect-to-be-ready stuff wanted.

OES Notes

K1DIO, Winchester, Mass. — Best E_s opening of year on 50 Mc. observed May 12. Most of Middle West, plus VE3, heard.

W1EXZ, Danville, Vt. — Looking for local activity on 6 in Northern N. H., Vt., or in Eastern Townships region of Quebec. All "local" contacts presently are over the mountains in Maine.

220- and 420-Mc. STANDINGS

220 Mc.

W1AZK	9	3	412	W4UBY	7	5	320
W1HDQ	11	5	450	W4UMF	11	5	420
W1OOP	12	4	400	W5RCI	6	4	700
W1RFU	11	5	480	W6NLZ	3	2	240
W1UHE	11	4	385	K6GTG	2	2	240
W2AOC	13	5	450	W6MMU	2	2	225
K2AXQ	8	3	230	W8LPD	6	4	480
K2CBA	8	5	315	W8PT	5	3	550
K2DIG	4	3	140	W8SVI	6	4	520
W2DWJ	13	6	740	W9EQC	7	4	740
W2DZA	12	5	410	W9JCS	5	2	340
W3AHQ	4	3	180	W9OVL	5	2	290
W3LCC	8	5	300	W9UED	4	4	605
W3LZD	14	5	425	W9ZIH	5	2	270
W3UJG	11	5	400	VE3AIB	5	3	350
W3ZRF	5	3	112				

420 Mc.

W1HDQ	8	3	210	W2DZA	5	3	130
W1RFU	8	4	410	W4VVE	6	4	410
W1OOP	9	3	390	W5RCI	4	3	340
W1UHE	3	2	430	W9GAB	5	–	355
W2BLV	11	5	360				

W1HDQ, Canton, Conn. — V.h.f. men with aurora experience may have wondered why 144 Mc. seems to be good for greater distances sometimes than 50. W. H. Flood, of the Cornell Aeronautical Laboratory, told why, in a paper presented May 4 at the URSI meetings in Washington. Not unlike the ionosphere, the aurora shows considerable absorption at times. When the absorption is high at 50 Mc. the effective working range will be greater at 144. Add one more reason for bearing down on 220 when aurora shows up on lower frequencies.

W4FNR, Ft. Lauderdale, Fla. — Worked LU9EW, Tierra del Fuego, several times in April. He is at the southern tip of Argentina, 750 miles south of Buenos Aires. Latitude is comparable to Northern Labrador, Hudson Bay or Southern Alaska in this hemisphere. Worked ZE3JU crossband April 3, and was heard by him again April 24. Worked ZL2DS April 25.

W4FWH, Doraville, Ga. — Looking for information on YE-3 homing beacon transmitter.

W4RMU, Jacksonville, Fla. — Recent nightly tests with beam south produced 50-Mc. QSOs at distances of 150 to 250 miles regularly. Nearly all stations worked were running 100 watts or less. Over 200 per cent increase in 50-Mc. activity noted in past year. Gear for 220 Mc. in works.

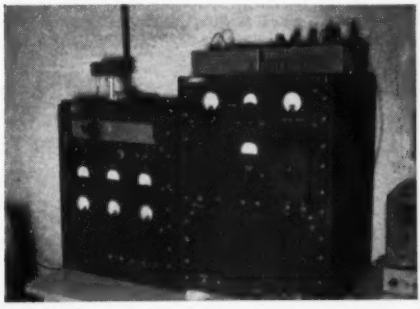
W4TOI, Sheffield, Ala. — Working toward regular 2-meter link with Huntsville, Decatur and Birmingham.

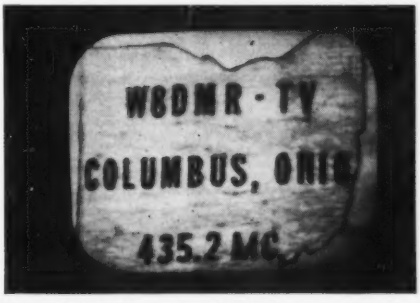
W6OJB, Orangevale, Cal. — Worked W6NTV, Turlock, 85 miles, regularly on 432 Mc. during April. Heard W6BUT, Taft, 265 miles, once.

W6PBC, Belmont, Cal. — "All-band receiver" (28, 50, 144, 220, 432 and 1296 Mc.) nearing completion.

W7MAH, Reno, Nev. — Sked on 50 Mc. with K6TYW, San Mateo, 190 miles over very high mountains, produced weak c.w. copy with 2-minute S9 burst. Use of high power on 144 Mc. delayed by bad 4X250B.

K9HWC, Wheaton, Ill. — Would like c.w. skeds on 50 Mc. with stations in Iowa. QST





In April QST we showed pictures of amateur TV stations W8RRJ and W8DMR in action. At the left we see the business end of W8RRJ. The TV screen, right, shows how W8DMR is received at W8RRJ, over a distance of 14 miles. Details of the W8RRJ setup appear in the text.

CONDUCTED BY ELEANOR WILSON,* W1QON

More Showers Predicted

IT WAS probably inevitable that sooner or later YLs would get around to "radioizing" showers — not the rainy kind, of course, but the type that involves that familiar old bird, Mr. Stork. The May column carried a story of a W7 airwaves shower. The following is a brief report of a second shower system centered around the Sacramento Valley area.

One sunny afternoon recently Zona Oliver, K6LVE, of Sonora, California, found herself surrounded on the 40-meter band by her good friends the Camellia Capital Chirps (Sacramento YL club), who suddenly forsook their usual courteous operating habits and proceeded to jam up frequencies with over-modulated shrieks of surprise. Not expecting such unusual transmissions, Zona temporarily succumbed to mike fright but quickly rallied and graciously accepted all of the pleasantries of the novel affair. Though not specifically invited, several OMs couldn't resist breaking into the party to offer congratulations. One even went so far as to say 'twould be a girl, because he caught a pip of a YL harmonic on his "pan-adapter"!

Forecast: showers of this type are likely to spread into other sections before long. Fun warnings are up.

YL DXCC Additions

Two additions should be added to the list of DXCC YLs which appeared in the May column. Alena May Jablonsky, WØMRJ, was awarded DXCC #1480 (phone) on April 6, 1959. Frances Krepp, W4KYI received certificate #3389 way back in February, 1958.

To make amends to W4KYI for overlooking her two years running, we'd like to do something for her that we often would like to do for other YLs too but generally cannot because of space limitations, and that is to list all of the certificates and awards Frances has gathered in the thirteen years she has been a ham. An impressive list it is, too: WAS, WAC, DXCC, RCC, DX-YL, ARRL Public Service award for helping in Hurricane Hazel, GE Edison Award certificate for work in same hurricane, Lads'N' Lassies certificate, Kingsport, Tenn. award, Jamestown Festival certificate, CR7 Mozambique centennial certificate, Car-le RC certificate of achievement, Boiled Owl certificate, high score YL phone in YL-OM contest, 1953, highest YL score in YL-OM contest 1954, high phone score in YL-OM contest 1955, highest YL phone score for fourth district in YL-OM contest 1957 and 1958, and YLCC with four stickers. W4KYI does most of her operating on 20 or 75 after midnight EST. Her OM is W4SIB and her mother is W4ZOI.

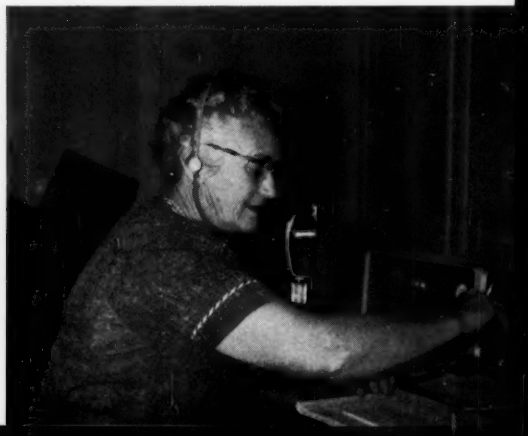
Keeping Up With The Girls

Net News:

The *Loaded Clothes Line YL Net*, which meets Monday at 0900 MST on 7235 kc., has completed its first year as a net

*YL Editor, *QST:* Please send all news notes to W1QON's home address: 318 Fisher St., Walpole, Mass.

At a demonstration of ham radio for the benefit of foreign delegates to the Ninth Plenary Session of the International Radio Consultative Committee (CCIR) at the Biltmore Hotel in Los Angeles, the Los Angeles YLRC provided the operators for station K6USA for one 24-hour period. YLs who operated were K6s ANG, BUS, KLN, LMV, MQS, OQD, PFY, VAP, VFE; W6s CEE, DXI, JZA, NZP, QGX; and WA6AOE. The photos show Maxine Hanberry, WA6AOE (left) and Elsa Wheeler, W6JZA (right) taking their turn at operating.



A mainstay of the South Africa Women's Radio Club, Diana Green, ZS6GH, is known the world over. For 21 years, she has served as president, secretary, and editor of the *YL Beam*. Look for her on 20 and 40, c.w. and phone.

President of the Georgia Peaches YL club, Peggy Butterfield, K4KKR of Atlanta is also ARRL Assistant Director for the Southeastern division and an NCS for the Cross-Country YL net. Peggy says her radio favorites are 15 meters and YL nets.

with a membership of forty. New members are welcome — three check-ins out of a possible five are required. A certificate is offered for working 10 members, off net time. New officers are pres. and NCS KØMNI; v.p. WØZWL; secy. and alt. NCS K5ECP; pub. chmn. W5RZJ.

The *Floridora C.W. Net* has changed its meeting from Wednesday to Friday at 1330 EST on 1785 kc. KN4ANR is manager.

Frequency of the *Georgia Peach Net* is 7260 kc. Meetings are Thursday at 0900 EST.

Time for the *Texas YL Round-Up Net* changed on June 4 for the summer. The 3880 kc. net starts at 0700 CST on Thursday and the 7235 kc. net starts at 0900 CST same day.

A round table on 3750 kc. at 1300 on Monday replaces the regular 80 meter c.w. net of the *Ladies Amateur Radio Klub* for the summer months.

You are invited to get out your iron and board and pleasantly zip through your laundry while checking into the *Ironing Board Net* on 3920 kc. at 0900 PST on Wednesday. K6HHD and W6YKU are NCS.

Certificates:

WHO (Women Ham Operators of Tarrant County) It is now necessary to work only three members for the club certificate, which may be obtained by sending a log to Mary Brewer, 7101 Robinhood Lane, Ft. Worth, Texas.

Lads 'N' Lassies New rules effective July 1, 1959 require contact with 10 members of the Los Angeles YLRC since Jan. 1, 1952. Contacts made during net time do *not* count. Submit copy of log to Ruby Word, W6WRT, 2140 N. Valley St., Burbank, California.

Georgia Peach Membership in the Georgia Peach Club has been extended to YLs in neighboring states (North and South Carolina, Tenn., Ala., and Fla.) and such non-Georgia YLs will be accredited one-half point toward the Georgia Peach Certificate.

Young Ladies Radio League The club has ruled that Alaska will be considered as a state for the WAS/YL award but as DX for the DX/YL award. Inquiries and applications for the following awards should be sent directly to the custodians listed for such awards: WAS/YL — Grace Ryden, W9GME, 2054 N. Lincoln Ave., Chicago, Illinois; WAC/YL — Barbara Houston, KØLYV, 1385 Northview Drive, Marion, Iowa; DX/YL — Maxine Willis, W6UHA, 6502 Wynkoop St., Los Angeles 45, Calif.; YLCC — Katherine Johnson, W4SGD, Box 666, Fuquay Springs, North Carolina. A certificate directory which includes rules and requirements may be obtained for 25¢ from Jan O'Brien, K6HHD, 3417½ 6th Ave., Sacramento 17, California.

Clubs:

Young Ladies Radio League — Secretary K6EXQ is trying to determine how many YLRL members are also members of the ARRL. A card to Connie Hauck, K6EXQ, 794 Gleneagles Ave., Pomona, California, stating whether you are or are not an ARRL member ("family" membership is allowable, of course), would be greatly appreciated.

South African Woman's Radio Club — New officers are pres. ZS5OB; v.p. ZS5RI; secy. ZS5FN.

Los Angeles YLRC — New officers installed in June: pres. K6BUS; v.p. K6ANG; secys. K6MQS, WA6AOE; treas. K6OAI.

Floridora YL Club — New officers are pres. W4UF; v.p. K4RNS; secy. K4LCD.

Miscellany:

The Central Radio Club of Russia sent W1WPX of Rhode Island a pin in recognition of Evelyn's high c.w. score in the 1958 DX contest sponsored by that club. . . . A merit award for public service was given to Lenore Conn,

Eleven-year-old K1HIR participates in Bryantville, Mass. c.d. operations, while proud father K1HIG and interested brother KN1HME look on. A Novice at 10 and a General Class licensee at 11, Mary Lampi works 40-meter c.w. at her home QTH. K1HIR was welcomed as the newest and youngest member of the fast-growing (125 members) Women Radio Operators of New England at the club's annual luncheon on May 2 at Newton, Mass.

W6NAZ, by the Radio and Television Women of Southern California. . . . In appreciation of her outstanding work as manager of the Northern California Net W6QMO was presented with a chrome bug by net members. Jeri's new QTH is in San Francisco where she will continue her traffic activities as RM for that section, in addition to her NCS duties on NCN and PAN. . . . The first three to win in the Worked All Florida Counties contest were YLs — *W4s* BIL, BWR, and K4RNS. . . . K4LCD, Margaret, is a new OPS. . . . The radio magazine of Finland will soon feature a YL column edited by OH2FB, Marie. . . . YLRL eighth district chairman W8ATB reported a record attendance of 40 YLs at the twelfth annual Grand Rapids convention in April. . . . Charter member of the YLRL, Enid Aldwell, W6UXF, graduated from U.C.L.A. in June with Phi Beta Kappa honors. Enid is planning a trip to Europe with visits to YLs in Austria and Germany. . . . K6ENL, Aleta, has a new A-1 Op. certificate for her shack wall. . . . OH2SM, Carola, has worked 149 countries in the past year. . . . Cub scout den mother K9HGY introduced ham radio to seven wide-eyed cubs during a den meeting at Bev's Cicero, Illinois QTH. . . . OM W8IEC doiefuly reports that he has "gone through" three YL-OM contests without contacting a Wyoming YL. Though he has YLCC he still lacks a Wyoming YL for WAS/YL. Hopefully Steve mentions that he operates 14, 20, and 40 phone on c.w. daily in the late afternoon.

Coming YL Get-Togethers

YLRL Convention

The third international convention of the Young Ladies Radio League is scheduled for June, 1960. The Women Radio Operators of New England will serve as hostess club. Onie Woodward, W1ZEN, and Millie Doremus, W1SVN, are co-chairmen. The event will take place somewhere in the Boston, Massachusetts, area. Watch this column for details as they develop.

ARRL New England Division Convention — YL Program

Sept. 5 and 6 at the Statler Hotel, Hartford, Connecticut. In addition to all general convention activities YLs will have their own special luncheon and fashion show in the glamorous hotel Terrace Room on Saturday and an informal "brunch" on Sunday. A large suite will be set aside as ladies headquarters for comfortable lounging and ragchewing. The Women Radio Operators of New England club will conduct a brief business meeting for the purpose of discussing the third international convention of the YLRL (see item above). For XYLs there will be SWOOP, a kind of order of the good time for the unlicensed wives of hams only. Advance registration is $4.00 or $8.50 for registration plus banquet. Checks should be mailed early to Harold Flagg, W1RVZ, 80 Cedar Ridge Drive, Glastonbury, Conn. QST

During a two-week period in February, the four hams in the photo (left to right, W6WWW, K6SBL, W6FEA, and W6WJF) staged a "dry run" of radio operations at Squaw Valley, Calif., in preparation for amateur assistance for the winter Olympics there in 1960. Hoping to be of service to the Olympic participants and the ski patrol, doctors, security police, etc., next year, Gertie Cassady, W6FEA, concluded that the test overall was quite satisfactory. Not shown in the picture but on hand for six days of the trial run, Joyce Harrington, K6QCL, will lend her special ability to speak six languages fluently.

The good sports in the picture show us what the well-dressed YL might have worn a hundred years ago. Occasion for the step back into history was the ARRL Oregon state convention in Roseburg in May when W7s HHH, SBS, WTK, RIC, CSQ, RAX, DIC and K7BII (left to right) donned "centennial dresses" to publicize Oregon's 100th birthday. Not to be outdone by the distaff side, a number of OMs grew authentic beards to help celebrate the historical cause.

Correspondence From Members-

The publishers of *QST* assume no responsibility for statements made herein by correspondents.

MAY ISSUE

1818 South Sepulveda Blvd.,
Los Angeles 25, California

Editor, *QST*:

By golly, the May cover of *QST* sure brings back some memories!

— *Lew Harter, WA6CAK*

51 Grant Street,
Bangor, Maine

Editor, *QST*:

The cover on May *QST* is interesting to me, also the article "History in the Making." The equipment not only interests me but looks familiar. I have several pieces of old apparatus some of which was used by me in 1909.

As this is my fiftieth year as a radio amateur I would like to hear from anyone that has been in the game 50 years or more. Just a QSL card would do, showing present age and date started in ham radio.

— *P. L. Sprague, W1UP (ex-1AO)*

P. O. Box 201,
Loma Linda, California

Editor, *QST*:

Thank you for Mr. Villard's excellent article on "Russia's Electronic Iron Curtain" (May *QST*, page 86).

There is one comment which seems possibly inaccurate. On page 88, first column, last paragraph, it says the U.S.S.R. allows the U. S. to "shout in English until it is blue in the face." I have heard these jammers zero in on VOA transmissions just as described clear out here when the Russian language programs begin.

The other morning (before I had read the article) I was passively listening to a VOA news transmission near 15.1 Mc. in *English*. They started talking about the U.S.S.R. and in less than 5 seconds, the signal was jammed . . . even here!

— *Gordon E. Simkin, W6KUH*

109 Mullin Lane,
Wilmington 3, Delaware

Editor, *QST*:

Re VOA, it appears that, by dint of colossal efforts by all parties concerned, the over all result is considerably less than zero. Do you have any suggestions for reducing this waste of talent, radio spectrum space, power and my taxes?

— *Joseph L. Gillson, Jr., W3GAU*

2783 Kenmore,
Berkley, Michigan

Editor, *QST*:

The May issue is the GREATEST. Those fellow hams who complain that *QST* has a lot of junk that a real ham shouldn't bother with should peruse this issue with the greatest care. Fifty kilomegs, 2N247s on 50 Mc., towers for less than $20, and all the rest, show the value of a real ham-type attitude.

In particular, I am intrigued by W1IPV's work with printed circuit stock. I have a number of pieces of gear built on chassis made from two gallon oil cans. Vy FB, but they do get a little wobbly. Many tnx to W1IPV.

Seems to me like W1ICP really wants to see us Novices get off to a good start. I had wondered for some time just how to couple my xmtr to my vertical. About three days after my license came in the mail, OM McCoy came thru with his 80-meter loading bit in the August '58 issue. I cut the *L* and *C* in half and was on 40 meters that nite. A check with a sensitive wave meter coupled to the base of the antenna showed "without harmonics". No trouble with TVI at all. . . .

I homebrewed a converter almost exactly the same as McCoy shows in this May issue. I ran into all sorts of trouble with oscillations in the r.f. stage. I finally cured it by following the recommended practice of bypassing right to the chassis at the tube socket. It is just as necessary, I feel, to apply this technique to any r.f. amplifier. The converter is now extremely hot in performance and at the same time is very cool with respect to spurious responses.

. . .

— *Bernard W. Joseph, KN8LIX*

RFD 4, Baldwin Path
Huntington, New York

Editor, *QST*:

My fourteen-year-old son (WA2BNK) is a member of your League and an enthusiastic radio engineer. Glancing through your May issue, it struck me that if only more of our youth could be encouraged to become radio amateurs, there would be a great drop in juvenile delinquency. Though the construction of electronic and radio equipment is incomprehensible to me, to the boys brimming with energy and curiosity it makes an absorbing hobby besides imparting painless instruction for the future. As well as combatting juvenile delinquency, an interest in amateur radio also would be a help, it seems to me, in lessening bad feeling, fear, aggressiveness among nations. After all, it is the world's young people — assuming a rational denouement of world problems — who are going to boss this shrunken planet pretty soon. To avoid the injustices and divisions of the present day, they must be able to give-and-take and communicate understandably together.

Since it respects no boundary lines, radio by its very nature is international.

— *Mrs. P. Cammer*

QS-59

Promotion Branch,
CGS Laboratories, Inc.,
Ridgefield, Connecticut

Editor, *QST*:

We were happy to fly along with WIOU as he described the QS-59 Communications Receiver in the April issue. During part of the journey, we felt as if we were covering familiar territory, particularly when he described the auto-tune circuits. According to WIOU, these auto-tune circuits slowly scan the band, stopping automatically at each signal for 20 seconds before releasing and moving on to the next. We at CGS Laboratories once designed and demonstrated an electronically-tuned automobile radio with a signal-seeking feature. It would automatically scan the broadcast band, stopping at each station. If the driver was not satisfied with the program, he could press a button and the radio would re-tune itself to the next station. Tired DX men (even those with a few less than 275 countries) could, of course, modify such a design to save themselves the onerous task of pushing the button.

The article, "Ferrite Inductors Tune Panoramic Receiver" by CGSL engineer Fred Gabriel (referenced in a footnote) was familiar also, since it describes the PAN-1 receiver which we manufacture for commercial and military applications. For selfish, commercial reasons, we keep reprints of this article, "Tuning Receivers with Controllable Inductors" which appears in issue No. 4 of "Incroductor Notes." We should be happy to send copies of these articles to *QST* readers requesting them.

— *Fred J. Grossman*

TNX — LID!

211 Crafton Road,
Bel Air, Maryland

Editor, *QST*:

I would like to thank the gentlemanly and thoughtful amateur who, on May 16, so kindly repeated your code

(*Continued on page 148*)

Operating News

F. E. HANDY, W1BDI, Communications Mgr.
GEORGE HART, W1NJM, Natl. Emerg. Coordinator
PHIL SIMMONS, W1ZDP, Asst. Comm. Mgr., C.W.
ROBERT L. WHITE, W1WPO, DXCC Awards
LILLIAN M. SALTER, W1ZJE, Administrative Aide
ELLEN WHITE, W1YYM, Asst. Comm. Mgr., Phone

All-Women Transcontinental Air Race. For the eighth consecutive year plans are being made for amateur work in this activity. W3GTC (Communications Chairman) writes that this race starts from Lawrence, Mass. July 4 and terminates in Spokane, Wash. six days later. Operation between 0430 and approximately 2100 daily will use 7210 kc. (day) and 3953 (night frequency) to interconnect the relay points: Lawrence, Mass. W1PFA; Binghampton, N. Y. W2MTA; Youngstown, Ohio W8GQD; Kokomo, Ind. W9MWC and W9HUF; W. Chicago, Ill. K9CQF; Rochester, Minn.; Fargo, N. D. WØCAQ; Bismarck, N. D. WØHVA; Miles City, Mont. W7YUP; Helena, Mont. W7WMT; Spokane, Wash. W7HCJ and W7OBH.

Cooperation is earnestly requested of all amateurs, to try to operate clear of these frequencies, or standing by to observe the progress and steer unintentional interference elsewhere, without directly using the frequency engaged in this amateur enterprise. Should distances and conditions require, W3GTC and those lined up will call upon and then appreciate relaying assistance in putting any vital traffic through.

Countries List Policy. Occasionally ARRL gets letters expressing the wishful thought that the ARRL Countries List be frozen; no additions and no deletions, or any changes in the future. Then again, wishful thinkers during the tougher side of the sunspot cycle and at other times often suggest island areas that ought, in their opinion, to be raised to the status of countries in Operating Aid No. 7. This official "countries list" is issued in revised form annually as well as given in each *Handbook*. As for a list with *never* a change it must be said that the changing political and geographical facts of life always have to be taken into account. The political framework of the world is subject to change. If there were no changes there might be some momentary acclaim but a list soon out of date would soon be subject to ridicule as to listings both obsolete and unrealistic. On the other hand, there is of course no justification for raising Long Island or Catalina Island or comparable territory having no pronounced geographical separation and no autonomy from a parent nation to countries-list status.

On the surface it might appear a simple matter to act at once on every *proposed* new country. Without any pretense that our list is perfect, it is well built on specified policies for the most part and the fact remains that we must have a reference list to follow for all comers. Let us make it clear that such changes as have to be made are not for the sake of change but for good reason. In today's scheme of things, the League rests the case for a given country decision on three standing criteria, once the facts applicable have been obtained in necessary detail from competent political and geographical authorities. Sometimes, in cases of political dispute between countries (these things go on for years), we have been obliged to turn to the U. S. Department of State as well as the world's recognized geographical societies and authorities to secure their information.

The criteria that determine country status and also any precedents in the ARRL List are given careful examination with respect to each case. In the ARRL Countries List the aspects examined as having importance are: (1) the degree of political-administrative independence, (2) the geographical separation, and (3) if the given areas have foreign land between. Many details have to be weighed, so there is an advisory staff-group of seven, all of whom hold postwar DXCC membership, incidentally, to review the maps and the case presented as new problems are posed.

Geographical separation from the mainland may serve to swing an area into place on the Countries List even when the political setup alone might not enable it to make the grade; likewise the form of government itself, degree of autonomy, representation or integration, has importance as well as geographical position. In the final analysis when a new country is added to the List or an old one taken off, there's a good reason for the change after such matter has been considered from all angles. The referenced List is available as Operating Aid No. 7.

Traffic and Me. *Watchwords*, the bulletin of the Traffic Hounds' Morning Watch, mentions the combined consequences of fulfilling a radio service and the values one receives in return. There follows an excerpt of the remarks by WØUTD on this subject.

"What do I get from trafficking? . . . I get a chance, on my favorite method of emission, to work the best fists in the business, to make many good friends with whom I have a common interest, to learn the most effective methods in operating, and sometimes to locate gear long since given up as unobtainable. These are purely personal things from the on-the-air contacts . . . the thank you letters from people to whom I have delivered a message are among my most prized possessions. The rewards of a traffic man

NATIONAL RTTY CALLING AND WORKING FREQUENCIES

3620 kc. 7140 kc.

are many. For the new amateur — a state for WAS, practice and good c.w., friendly advice on operating procedure. The invitation to join a traffic net is there for the asking, and "wallpaper" with pleasure in earning it. . . . A trafficker's interest to deliver even the most routine message bespeaks his integrity. I am very proud to be a Traffic Hound!"

Service Messages Rate Increased Use. The service message differs from other traffic in that it is a message from one station to another concerning the status of traffic. Usually prefixed "SVC" before the number a "service" should have the same care in handling given any other traffic. The text may refer to non-delivery, inadequate address, delayed transmission or factors other than the subject matter in a message. A "SVC" counts the same as other traffic, with a handling point for each time handled by amateur radio. Such abbreviations as SIG, UNDLD, and GBA are permitted for "signed" "undelivered" "give better address" and the like in this type message. Improved efficiency in traffic handling can be attained through more general use of service messages. K6EA (in W7FIX's PANN) asks, "Is there a more heinous crime trafficwise than *not* to send back a service to the originating station advising of non-delivery of traffic?" Services are good traffic and make an interesting way to trace messages for which no reply has come back, to ask a delivery report so as to check handling time, etc. K6EA says servicing originators to avoid the bad practice might stop some of the duplicate originations. For any of the gang complaining about a scarcity of traffic, we also suggest *not only* the idea of their starting off a few good domestic messages for themselves, the family, and friends, but that a percentage of service-type messages be sent, as may be called for. — *F. E. H.*

RESULTS, APRIL CD PARTIES

Here are preliminary results on the parties of April 11–12 (c.w.) and April 18–19 (phone), open to League officials and appointees. Figures show score claimed, number of QSOs and number of different sections worked. Final and complete standings will appear in the July *CD Bulletin*.

C.W.

W1TYQ	251,790	756-66
K5DGI	224,450	665-67
W3MSR	223,965	704-63
W9MAK	194,970	575-67
W3WJD	169,950	510-66
W9JJN	169,920	524-64
VE3BZB	168,210	530-63
W0NYU	166,320	521-63
K2PHF	165,690	519-63
K9ELT	165,120	512-64
W3KLA	162,260	532-61
W3LXU	155,855	504-61
K4CAX	150,155	502-59
W8IBX	144,320	446-64
W9LNQ	143,530	458-62
K4AJG	143,250	446-61
W3NF	141,440	435-64
W4BZE	138,125	420-65
W9YSX	134,400	443-60
K8CZJ	132,820	451-58
W1JYH	132,275	400-65
W6ISQ	131,840	405-64
W9NH	131,150	424-61
W4THM	131,100	460-57
W4SNH	128,835	404-63
K5BSZ	127,100	405-62
W8GKB	124,440	366-68
K4BAI	121,275	379-63
W1EOB	121,210	384-62
W1AQE	121,200	404-60
W2DRV	120,640	409-58
W1JTD	119,255	391-61
W9FVT	118,800	440-54
W7VIU	111,900	368-60
W3ZHQ	110,000	395-55
K9DWK	109,480	387-56
K6OJV	106,500	355-60
W1MX[1]	106,500	350-60
W4KFC	105,900	346-60
K4OYR	102,480	329-61
W7RGL	101,760	311-64
K2QYI	101,400	333-60
W9PCQ	101,310	301-66
W8PBO	100,170	367-54
K2MFF	100,050	339-58
W1AW[2]	100,035	344-57

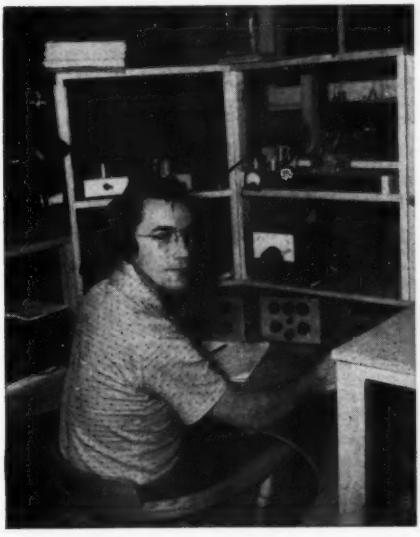
PHONE

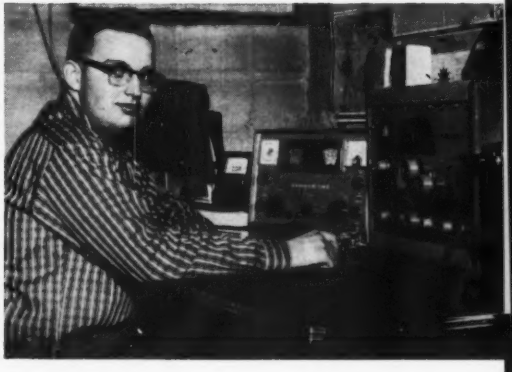
K2PHF	23,635	156-29
W1DGL	23,250	150-30
K2EIU	16,120	118-26
W1FYF	15,795	117-27
K2QZS	15,000	117-25
K1CAU	14,375	111-25
K1BEB	12,840	104-24
W9YT[3]	12,480	90-26
K2VAC	10,925	92-23
W1GKJ	9,555	86-21
W1MWB/1	7,985	86-19
W2COB	7,030	74-19

[1] Multioperator station; [2] W1WPR, opr.; [3] W9SZR, opr.

Meet a couple of traffic men who have consistently ranked among the top ten in recent c.w. CD Parties. At left is VE3BZB, ORS/RM and Ont.-Que. Net Manager, whose score of 168,210 led Canada and was seventh in the April standings. Gord is particularly interested in traffic, contests, Field Day, DX, and rag chewing. He has separate 700-watt finals under construction for all bands from 3.5-28 Mc., c.w. only, and pleads for more 160-meter party work.

Below **we have Illinois ORS W9MAK, active in such NTS nets as 1LN, 9RN, and CAN. Robert's 194,970-pointer was fourth of all c.w. appointees and top W9 tally. The gear includes a Conelrad monitor, HQ-100, DX-100, Matchbox, and time-sequence keyer.**





Let's see, this issue of *QST* ought to hit you either just before or just after Field Day, depending on how things are going at your post office. If you get it before: hope you have a swell time and rack up the highest score ever. If you get it after, you'll be busy summing up everything that went wrong (Murphy's Law, y'know) and resolving not to make the same mistakes next year — but you'll have forgotten it all by then.

Time was when the ARRL Field Day was primarily a test of emergency equipment. Most of the gear taken out was portable, built for the purpose, or in any case the smallest, compactest, simplest stuff that could be thrown together. The score was a factor, but emphasis was placed on the emergency communications angle. Nowadays, things are different. The Field Day usually results in temporary dismantling of the home station. Commercial transmitters, receivers, beams and rotators are lugged out to the field and installed, not to mention electronic speed keys, shiny crystal microphones and other accessories. Weight and portability are no objects. The main consideration is the score, attained with the least possible effort. Thus, FD has become just another knock-down-drag-out cutthroat competition with complicated rules, some of them tailored to accommodate standard commercial equipment.

In the late forties, we started having an emergency communications exercise dedicated to just that, without competitive scoring — the Simulated Emergency Test, held in October each year. More recently, we have participated in the annual civil defense Operation Alert, held in the late spring or early summer each year. So now there are really three opportunities per year to put your emergency organization and equipment through its paces, if you want to: The June Field Day, the October Simulated Emergency Test, and Operation Alert. Of course you can have your own local test any time, but these are nation-wide activities. The Field Day and the SET are ARRL activities, Operation Alert is a c.d. activity. The League sets the dates for the former; the Office of Civil and Defense Mobilization, a government agency, sets the dates for the latter.

Perhaps it would be well to point out the differences between these three annual activities. Judging by the number of letters and messages we have been receiving reporting participation in the Simulated Emergency Test, when Operation Alert is meant, there seems to be some confusion. Briefly, the Field Day is a contest, the SET is an AREC emergency test and Operation Alert is a civil defense test covering amateur communications (RACES) only as part of a much broader activity. The first features going out into the field and "roughing it." The SET may have a field aspect, but it concentrates on communications tie-in with agencies to be served in an emergency and has a strong traffic-handling flavor. OPAL is a nationwide test of all civil defense activities, of which communications are only a part; of this part, amateur radio (RACES) is a sub-part.

These three activities, although different in object, have many similarities which are often confusing, especially to newer amateurs. Each is an important part of your amateur radio education. We urge that you participate in all three to get the full benefit of the diversified experiences they have to offer.

—···—

We are still getting reports of amateur participation in the January snow-ice storm and floods resulting therefrom in Ohio, Indiana and Illinois. Although we are glad to get these reports and summarize them herewith, the piecemeal aspect of their receipt does not speak well for the centralization of such activities in these three sections.

From the *Bison Banter*, we glean that in Steuben County, in Northeast Indiana, amateur radio operators kept emergency communications channels open around the clock from January 21 through January 23. It started on January 21 when Angola lost all outside telephone communication, at which time K9GLL went on the air with W9YCB/m. Stations began reporting in until the area from Fort Wayne to Battle Creek was covered, furnishing long distance emergency service until regular service was restored. K9CLL operated on emergency power until his antenna fell, after which the Angola link was furnished by a mobile unit in front of his house, W9YCB assisting. On Jan. 22 it was learned that Orland was without telephone service. A mobile was dispatched and W9FEI set up station in his shop to monitor. A portable station was established in Orland and around-the-clock established until Jan. 24. The following were instrumental in maintaining constant communication with Orland and Angola: K9HTJ W9MS K1INC/9 W8-JAR/9 and KN9LTE. K9GLL got a temporary antenna up and on Friday (23rd) four additional amateurs showed up to assist: *W9s* QWI MDC YVS and K9AIN. Emergency operations were discontinued at noon on Jan. 24 when the situation was considered no longer serious.

In St. Clair County (Belleville), Ill., the Illinois Central Railroad asked local amateurs for assistance on Jan. 21 when they temporarily lost their telegraph and telephone lines. K9KHN at the St. Clair County C.D. Center was manned for several hours by W9RQR and K9BIY until telephone communication was re-established. All operation was on 3940 kc., the Illinois Emergency Net. — *W9JMY, EC St. Clair County, Ill.*

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The late March snowstorms in Western Nebraska took the form of heavy rains in the Hastings area. The Central Nebraska Public Power and Irrigation District asked WØPDJ for assistance. Dead power lines in the McCook area were re-energized through orders dispatched by amateur radio concerning necessary switching to alternate circuits. WØPDJ found it necessary to relay instructions to KØFCR in South Dakota who in turn sent them to WØVOZ in McCook. The following day (Mar. 26) the Hastings Western Union office contacted WØPDJ and WØMPE with a request to relay traffic into the area around McCook. Skip conditions on 40 phone were such that it was necessary to solicit assistance from KØFCR in South Dakota, KØLTJ in Missouri and WØCOC in Colorado, but much emergency traffic was handled. — *WØLJO.*

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Early on the morning of April 2, a tornado hit Dade City, Fla., and Orlando and Mims had similar visitations later. W4SDR of Daytona Beach and K4RNR monitored 75 and 40 meters. W4PZT reported in to say that he had received a call for help from a telephone operator in Dade City and wanted it relayed to the c.d. director. By 0900, 7230 was humming with a full-fledged emergency net with W4SDR in control. Some Red Cross and c.d. traffic was handled, rumors of other tornadoes investigated and scotched, and numerous miscellaneous queries for information answered. K4AHW and W4UHY were also actively monitoring for the Weather Bureau and state c.d. headquarters. The alert ended at noon, with about 30 amateurs having participated. — *W4IYT, SEC Eastern Florida.*

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The Musselshell Valley from Martinsdale to Sumatra, Mont., was hard hit by a snow and sleet storm on April 16 which knocked out communication and power lines. The Milwaukee Railroad asked W7NPV for the help of amateurs in locating and dispatching trains in the affected area. W7NPV/m, who was in Miles City alerted W7YUP (EC for Miles City) and put out a call on 75 meters at 0530. Contact was established with *W7s* QYA RZY INM (EC for Harlowton) JRK SZB YHS (EC for Billings) and K7CHA. When conditions got poor on 75, operation was shifted to 40. W7ZUK (EC for Roundup) and W7ZUJ joined the net when their power was restored at 0900. Throughout the day, the amateurs dispatched trains, located trains, surveyed the storm damage, dispatched telephone crews and handled various other messages for the Milwaukee Railroad and other agencies, as well as for individuals. Telephone communication was restored at 1845, so the amateur net was secured for the night. The next morning *W7s* ZUK RZY and NPV operated for a short time to locate a train in the roundup vicinity. Many other amateurs assisted by keeping the channels clear and by standing by to relay, if necessary. Favorable publicity appeared in the Harlowton *Times* and the Miles City *Star*. — *W7NPV, SCM Montana.*

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On April 25, five children were lost in the mountains of Sussex County, N. J. Five amateurs joined the search until all five of the children were found safe. K2YNO/m joined a search group, W7IJG/2 carried a pack set, K2VOT/m stayed with the headquarters at the Stockholm Fire Dept.,

Members of the Fort Myers Amateur Radio Club set up this exhibit at the Southwest Florida Fair. Operators shown, from left to right: K4ZAP, W4KET, K4OBD W8CWX/4, K4KPE.

K2AGV assisted from his home in Sparta, and K2CBK maintained contact with all plus the radio police via landline. — *K2CBK.*

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Last Nov. 19, W7BVZ/7 had an eye-witness account of a jet plane crashing across railroad tracks and derailing a speeding train. It seems he was in contact with W6EXQ/6 who was c.w.-mobiling near El Toro Air Base when the crash occurred. The jet ripped across the railroad tracks about 200 yards away and the 70-m.p.h. diesel had struck the wing. The train derailed, buckling the rails ahead of it. Apparently the brakeman was able to get the pilot out before the wreck burst into flame and, miraculously, nobody was seriously injured. No emergency communication was involved, but probably W7BVZ was the only person to have an eye-witness account of the mishap. — *W6EXQ.*

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Cuyahoga County (Ohio) AREC Project #53 was an annual fund drive for the benefit of crippled children, held Mar. 15 with 33 amateurs taking part. Fourteen mobiles, two portable stations and two fixed stations were used to facilitate pickup of about $35,000 from 60 collection centers. The drive was held under severe weather conditions with winds up to 82 m.p.h. and heavy snow. In spite of this, everyone showed up and a successful activity was enjoyed by all. A project like this is *work* to most people, but the amateurs have a ball and perform a worthwhile public service at the same time. Give it a try, some time. — *W8AEU, EC Cuyahoga Co., Ohio.*

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On Apr. 2, 3, 4 and 5, a home show held in Belleville, Ill., had a c.d. display that included an amateur radio station. Six amateurs of the St. Clair Amateur Radio Club assisted during the four-day demonstration. All operation was done on 2 meters. — *W9JMY, EC St. Clair County, Ill.*

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Amateurs in Asheville, N. C. set up a station at the annual convention of the North Carolina Pharmaceutical Association on Apr. 19, 20 and 21. Each person attending the convention received a card offering the services of amateur radio in sending a message back home, and message blanks were conveniently located throughout the convention hotel lobby. A 65-watt transmitter was set up in the hotel lobby, but reception was noisy so the transmitter was moved to the top floor. Traffic was passed on 10 meters to local amateurs who relayed it to nets and at random. Only about 40 messages were originated, but the amateur station created a great deal of interest at the convention. — *W4EFY.*

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March reports were received from 24 SECs, representing 7581 AREC members. This is a substantial gain over last March both in number of reports and AREC members. Sections reporting: Mo., Ga., E. Fla., Wash., N. M., San Joaquin Valley, E. Bay, Nevada, *Santa Barbara,* N. Dak., W. Va., W. N. Y., NYC-LI, Colo., Ore., Minn., Wis., Ala., Ind., S. Texas, Vt., Santa Clara Valley, *E. Pa., Maritimes.* Italics indicate initial 1959 reports from those sections.

NATIONAL CALLING AND EMERGENCY FREQUENCIES (KC.)

3550	3875	7100	7250
14,050	14,225	21,050	21,400
28,100	29,640	50,550	145,350

During periods of communications emergency these channels will be monitored for emergency traffic. At other times, these frequencies can be used as general calling frequencies to expedite general traffic movement between amateur stations. Emergency traffic has precedence. After contact has been made the frequency should be *vacated immediately* to accommodate other callers.

The following are the National Calling and Emergency Frequencies for Canada: *c.w.* — 3535, 7050, 14,060; *phone* — 3765, 14,160, 28,250 kc.

RACES News

Long Beach, Calif., has a very active RACES group under the leadership of K6ICY, RACES radio chief. On the Monday night net, the average number of check-ins was 26 stations in March, with extra operators bringing the operator figure up to 33 average. These check-ins are coordinated and are the basis for AREC reports monthly, making it important for RACES members to be in the AREC, and vice versa. Nets at present meet on 1¼, 2, 6 and 10 meters. In addition, a 10-meter hidden transmitter hunt is conducted on 29.4 Mc. each Monday at 2000 PST.

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RACES operators of the Rutherford, N. J., group assisted in a police drive to halt "mugging" incidents in the area. This RACES group is part of the auxiliary police of Rutherford. Thirteen amateurs and two non-amateur RACES operators patrolled streets for endless hours, running up mileage in excess of 2000 miles. All incoming buses were checked and persons getting off and walking down dark streets were seen safely to their homes, unbeknownst to them, by patrol cars. No incidents occurred but, as W2LKW says, many odd situations were encountered.

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Last November the St. Louis County (Mo.) Office of Civil Defense, under Deputy Director WØIGU, established nets on 6 and 10 meters to supplement the regular Sunday morning net on 3930 kc. After a slow start, the net increased in numbers until it now has a membership of over 250. The net is largely of the discussion type. Net control is WØIGU, operated from the joint St. Louis-St. Louis County C.D. Control Center.

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BRIEF

To help prepare locals for the General Class exams, W9IIE (Illinois) has been heading a study group for code practice and rag chewing each Friday night. KN9TAG, KN9RBR, KN9QLH, KN9RKV and an s.w.l. were in a recent group. KN9PRU and KN9PRV are on deck most weeks — despite some absences in view of plans for arrival of the family "harmonic."

A.R.R.L. ACTIVITIES CALENDAR

June 27–28: Field Day
July 2: CP Qualifying Run — W6OWP
July 18–19: CD Party (c.w.)
July 23: CP Qualifying Run — W1AW
July 25–26: CD Party (phone)
Aug. 5: CP Qualifying Run — W6OWP
Aug. 21: CP Qualifying Run — W1AW
Sept. 3: CP Qualifying Run — W6OWP
Sept. 16: Frequency Measuring Test
Sept. 19–20: V.H.F. QSO Party
Sept. 21: CP Qualifying Run — W1AW
Oct. 7: CP Qualifying Run — W6OWP
Oct. 10–11: Simulated Emergency Test
Oct. 17–18: CD Party (c.w.)
Oct. 20: CP Qualifying Run — W1AW
Oct. 24–25: CD Party (phone)
Nov. 5: CP Qualifying Run — W6OWP
Nov. 7–8, 14–15: Sweepstakes Contest
Nov. 18: CP Qualifying Run — W1AW
Dec. 2: CP Qualifying Run — W6OWP
Dec. 17: CP Qualifying Run — W1AW

OTHER ACTIVITIES

July 12: San Gabriel Valley Radio Club QSO Party, p. 10 this issue.

TRAFFIC TOPICS

Every month, in this column, we report how many messages were handled in a certain month by this net and that net. Some time ago we found, much to our surprise, that not all nets counted their traffic the same way. Some figured that a message sent from one station to another counted as one originated (or relayed) to the sending station and one received by the receiving station, making two points for the net. Presumably, if the receiving station delivered this message, it would count another point. Some nets, we have discovered, get their traffic totals by adding up the individual traffic totals for each net member. Still other nets count all traffic that is reported into the net, whether it is actually handled or not.

Well, every net of course has the right to set its own standards — we're not disputing that. We do submit, however, that unless we have an over-all standard there is no basis for comparison and net traffic totals are meaningless. Most everybody agrees with that, provided we adopt his standard and make it universal. Otherwise, there is dissention and lack of compliance.

Can't we get together on this, fellows? A few years ago (Apr. '55, page 74) in this column we set down a rule which was based purely on logic and which we felt could not but be acceptable to all concerned. Apparently we neglected to consider that (1) not all traffic men read this column and (2) not all those who do read it agree with what they read; add up both these groups and you have a sizable chunk of traffickers. So let's go over the ground again.

Probably most of the confusion comes from a mix up between two quite different concepts — individual traffic and net traffic. Individual traffic men get separate points for originating, relaying, receiving and delivering traffic. But a net does none of these things; a net passes the traffic from one station to another. It is therefore not possible to base the net's traffic on individual effort. Just as an individual and a corporation are two separate entities, even though the individual works for the corporation, individual traffic and net traffic are entirely separate, even though the individual participates in the net.

Simple? Of course! And logical, too. So let's see if we can carry the logic through to the matter of counting the net's traffic. If the net doesn't originate, relay, receive or deliver traffic (these are individual functions), then what *does* it do? Answer: it *handles* the traffic. And what constitutes a "handling"? *Simply the act of one station passing a message to another station in the net.* Not before the net, not after the net, but *during* the net.

Okay, you ask, but what means this "during" the net? When is a net "during" and when is it otherwise? Well, when you ask that question you are getting down to basics and definitions. The way we would define it, a net is not a net until it is in formal session, with a net control in charge. Once it meets this condition, its traffic is "traffic handled during the net" and counts toward that net's traffic total. So-called "informals" do not count either in the individual or net traffic total, and should not be part of any net's procedure while it is in session. A net is a formal procedure, designed to get the traffic handled accurately and efficiently. It has a definite beginning and a definite ending and observes definite procedure. Before and after, it can be a round table; but a round table is not a net.

The net's traffic count is the number of *handlings* of traffic that net performs each month. A handling is the transmission of a message by a net station and its acknowledged receipt by another net station while the net is in session. The count is made by the net control station and reported to the net manager, who computes the monthly total. A net is not eligible for BPL. Isn't this procedure simple and logical enough to merit majority approval? We think it is and does. But if it isn't and doesn't, we'd like to hear more about it.

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Net reports. The following nets have submitted the following data for April activities: Hudson Traffic Net, 30 sessions, 283 check-ins, 300 messages handled. Transcontinental Phone Net, 30 sessions, 2914 message handlings. Mike Farad Emergency and Traffic Net, 22 sessions, 346 check-ins, 367 message handlings. The 7290 Traffic Net, 44 sessions, 1455 check-ins, 560 messages handled. Early Bird Transcon Net, 30 sessions, 615 messages.

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National Traffic System. It's the little things that drive you nuts. For many years we have referred to nets covering a section as *section* nets and those covering an area as *area* nets; but those covering a region are called *regional* nets. Being something of a grammarian, this has always bothered us. The word describing the net should be an adjective, so "*regional*" is correct, but the adjective for section is *sectional*, and the adjective for area is *areal*. Should we call them "sectional" and "areal" nets? How ridiculous that sounds! No, we refuse to do it!

Recently, in revising CD-24, we had occasion to ponder this question further. What a dilemma! Shall we be correct, or shall we be consistent? In the end, we decided that if section and area sound better than sectional and areal, then region ought to sound better than regional, and *hang* the rules of grammar. So, when the next reprinting of CD-24 gets into distribution, you will see that we no longer have regional nets, but *region* nets. This okay by you, fellows? If so, maybe we can sleep nights again.

Another subject: It has been suggested that we put specific terms on net manager appointments. Of course, at section level this is entirely up to the SCM, who makes these appointments. At region, area and TCC level, we can set terms of office if we want to, but do we want to? The way it is now, if we get a good man we just let him keep the appointment. If an appointee falls down on the job, we start to needle him and ultimately, if necessary, force his resignation. To do this, we don't have to wait until his term is up. There are no renewals, no endorsements, and none of the managers gets the idea of resigning because his "term" is up. And, although we give every manager sufficient time and opportunity to make good, we don't have the temptation to forestall action on a delinquent manager because his term is almost up.

In the past, region and area nets have occasionally been left high and dry without a manager because the manager resigns without any notice, making it necessary for us to make haste in going through the procedures of appointing a new one. Usually, if someone is available, we ask for an acting manager to take over until a new one can be appointed. But it would help a great deal, we think, if region, area and TCC managers take it upon themselves to give us as much notice as possible of their intent to resign. Three months is not too far ahead to notify us, if you know that far head yourself; but we need at least a month.

April reports:

Net	Sessions	Traffic	Rate	Average	Representation (%)
1RN	29	534	.425	18.4	90.6[1]
2RN	60	587	.419	9.8	98.7
3RN	60	404	.309	6.7	87.7
4RN	58	633	.311	10.9	61.1
RN5	60	871	.362	14.5	94.1
RN6	60	1254	.485	20.9	93.0
RN7	60	716	.312	11.9	45.8
8RN	54	279	.200	5.2	77.3
9RN	59	810	.421	13.6	84.3
TEN	81	761	.408	9.4	58.6
ECN	27	52	.128	1.9	66.7
TWN	30	479	.386	15.9	74.5[1]
EAN	23	1125	.861	48.9	98.6
CAN	30	885	.651	29.5	96.7
PAN	30	1596	.888	53.2	98.9
Sections[2]	999	6756		6.8	
TCC Eastern	68[3]	304			
TCC Central	60[3]	913			
TCC Pacific	112[3]	1091			
Summary	1720	19949	PAN	10.3	PAN
Record	1319	19738	1.057	17.8	100.0

[1] Region net representation based on one session per night. Others are based on two or more sessions.

[2] Section nets reporting: Beehive (Utah); S. Dak. 40 Fone, S. Dak. 75 Fone, S. Dak. CW; SMN (Md.); GSN (Ga.); CN & CPN (Conn.); SCN (Calif.); NJN (N. J.); WSSN (Wis.); Tenn. CW; KMG, MSN, MSPN Noon, MSPN Evening (Minn.); OQN (Ont.-Que.); SCN (S. C.); ILN (Ill.); TLCN (Iowa); Early KPN, Morning KPN, KPN, KYN (Ky.); NWFN, FN, FPTN, TPTN, Gator (Fla.); BCEN (B. C.); QMN (two Mich. nets); AENO, AENT, AENB, AENP (Ala.); WVN (W. Va.).

[3] TCC sessions reported, not counted as net sessions.

A few records fell this April, but records as to rate, average and representation were made on previous years. Note the 100% reporting of the upper echelons this month and the fine reporting from section-level nets.

W2PHX reports that 2RN sessions are now held one hour earlier than previously. The net is still being plagued with "summer exodus," but will probably stay in business, Dick says. W2BZJ has earned his 2RN certificate. Certificates for 3RN performance have been issued to *W3s* PQ TN NNM ZLP FKE, *K3s* GPN ANA ANU and ANS. Western Pa. is still the weak link, but traffic is moving. W7QLH submits his first RN7 report, a complete job even though he doesn't yet have regular forms. K9DAC has earned his 9RN certificate. TEN has dropped its 1700 CST schedule effective May 1, until fall. ECN is having its usual summertime VE1 trouble. Five of the six regions of EAN are in 100% attendance the first four months of 1959. QRN is slowing down CAN, which uses 7125 kc. alternatively. PAN manager W6PLG (who is getting back on his feet rapidly, incidentally, after his bout with lobar pneumonia) reports that PAN now meets at 2000 PST on 7120 kc.; also, that KH6-DBI is checking in direct and some VE7s are checking in for RN7 — good signs.

Transcontinental Corps. Eastern Area manager W3WG announces the following vacancies on the TCC-Eastern roster: Station A (get traffic on EAN, put it into CAN) on Sun. & Thurs.; Station B (get Pacific Area traffic on EAN, give it to Station H) on Saturday; Station C (get traffic from CAN for the Eastern Area) on Sun. and Thurs.; Station D (get traffic from Station J for Eastern Area) on Sun., Mon., Wed., Thurs., Sat. If you want to have a crack at filling one of these vacancies, contact W3WG, TCC-Eastern Director.

WØBDR, TCC-Central director, is in charge of the traffic meeting at the Central-Midwest Convention in St. Louis, Aug. 22–23, so it should be a good 'un. Hope to see you there.

April reports:

Area	Functions	% Successful	Traffic	Out-of-Net Traffic
Eastern	68	100.0	1720	304
Central	60	98.3	1339	913
Pacific	112	96.4	2135	1091
Summary	240	97.9	5194	2308

The TCC roster: Eastern Area (W3WG, Dir.) — *W1s* AW NJM, W2VDT, *K2s* SIL UTV, *W3s* COK LXU WG, W9DO. Central Area (WØBDR, Dir.) — *WØs* LCX BDR LGG. Pacific Area (W6EOT, Dir.) — W5DWB, *W6s* EOT HC ELQ, WA6ATB, *K6s* LVR DYX CPQ HLR GID, *W7s* ZB GMC, BDU, K7CWV, WØKQD.

RESULTS, FEBRUARY FREQUENCY MEASURING TEST

The February 13 FMT, open to all amateurs, brought entries from 316 participants who made a total of 1404 measurements. Of these, 158 ARRL Official Observers submitted 756, 158 non-OOs 648 readings. Everyone taking part has received an individual report concerning the accuracy of his measurements of the special W1AW transmissions.

The standings of the leaders appear below. Decimal fractions are shown only to establish an order of listing because the official readings can be accredited just to 0.3 p.p.m. Hence W8CUJ, W8GBF, W1MUN, W9VZF, W5NKH, WØWKO, K6RTD and W8GQ share top honors equally and are to be congratulated on their precision.

Observers	Parts/ Million	Non-Observers	Parts/ Million
W8CUJ	0.1	W5NKH	0.1
W8GBF	0.1	WØWKO	0.2
W1MUN	0.3	K6RTD	0.3
W9VZF	0.3	W8GQ	0.3
W1VW	0.7	K8EQF	0.6
W9TZN	1.8	W8VVD	1.2
WØRRW	2.2	W3LQS	1.4
K2PIM	2.9	W3QVT	1.5
WØTRG	3.4	W8DD	1.5
W5KOD	4.0	K5IBZ	1.9
W6GQA	4.1	W1TWJ	2.3
W2QYT	4.2	W1QQO	3.5
W7CAF	4.3	K1GKF	5.4
W2AIQ	4.4	W2YGA	5.8
W6RKU	4.9	WØFNA	6.7

The following ratings are based on a single measurement: OO — W8YCP 0.1, W2FE 1.4.

W1AW SUMMER SCHEDULE

(All times given are Eastern Daylight Saving Time)

Operating-Visiting Hours:

Monday through Friday: 1300–0100 (following day).

Saturday: 1900–0230 (Sunday). Sunday: 1500–2230.

Exception: W1AW will be closed from 0100 July 3 to 1900 July 4 in observance of Independence Day. Also station operation July 6–22 and Aug. 3–19 inclusive is between 1900 and 0100 Mon. through Fri. during the attendants vacation periods.

A map showing how to get from main highways (or from Hq. office) to W1AW will be sent to amateurs advising their intention to visit the station.

Official ARRL Bulletin Schedule: Bulletins containing latest information on matters of general amateur interest are transmitted on regular schedules.

Frequencies (kc.):

C.w.: 1820, 3555, 7080, 14,100, 21,075, 28,080, 50,900, 145,600.

Phone: 1820, 3945, 7255, 14,280*, 21,330, 29,000, 50,900, 145,600.

Frequencies may vary slightly from round figures given; they are to assist in finding the W1AW signal, not for exact calibration purposes.

Times:

Sunday through Friday, 2000 by c.w., 2100 by phone.

Monday through Saturday, 2330 by phone, 2400 by c.w.

General Operation: Use the chart on page 103, May *QST* for times and frequencies for W1AW general contact with any amateur. Note that since the schedule is organized in EDST, the operation between 0000 and 0100 each day will fall in the evening of the previous day in western time zones.

Code-Proficiency Program: Practice transmissions at 15, 20, 25, 30 and 35 w.p.m. on Monday, Wednesday and Friday, and at 5, 7½, 10 and 13 w.p.m. on Sunday, Tuesday, Thursday and Saturday are made on the above-listed frequencies (except 1820 kc.). Code practice starts at 2130 each day. Approximately 10 minutes' practice is given at each speed. On July 23 and August 21, instead of the regular code practice, W1AW will transmit certificate qualifying runs.

*Single sideband.

CODE PROFICIENCY PROGRAM

Twice each month special transmissions are made to enable you to qualify for the ARRL Code Proficiency Certificate. The next qualifying run from W1AW will be made July 23 at 2130 Eastern Daylight Time. Identical texts will be sent simultaneously by automatic transmitters on 3555, 7080, 14,100, 21,075, 28,080, 50,900 amd 145,600 kc. The next qualifying run from W6OWP only will be transmitted July 2 at 2100 PDST on 3590 and 7128 kc.

Any person can apply. Neither ARRL membership nor an amateur license is required. Send copies of all qualifying runs to ARRL for grading, stating the call of the station you copied. If you qualify at one of the six speeds transmitted, 10 through 35 w.p.m., you will receive a certificate. If your initial qualification is for a speed below 35 w.p.m. you may try later for endorsement stickers.

Code-practice transmissions are made from W1AW each evening at 2130 EDST. Approximately 10 minutes' practice is given at each speed. Reference to texts used on several of

DX CENTURY CLUB AWARDS

HONOR ROLL

W1FH.....294
W6AM.....294
ZL2GX.....293
W8HGW.....293
PY2CK.....292
W3GHD.....292
KV4AA.....291
W9NDA.....291
W8JIN.....290
W6SYG.....290
W2AGW.....290
W6ENV.....290
W8BRA.....289
W3JNN.....289
W5ASG.....289
G3AAM.....289
G2PL.....289
W2HUQ.....289
W6CUQ.....288
ZL1HY.....288
W6DZZ.....288
W9YFV.....287
W1ME.....287
W9RBI.....287
W6GFE.....287
W3KT.....287
W2BXA.....287
W6MX.....286
W3BES.....286
W8DMD.....286
W8BKP.....286
W6ADP.....286
W6EBG.....286
W7AMX.....285
W7GUV.....285
W5ADZ.....285

Radiotelephone

PY2CK.....292
W8GZ.....284
ZS6BW.....283
W8HGW.....283
W1FH.....282
VQ4ERR.....281
W8BF.....280
W3JNN.....280
ZL1HY.....278
W9RBI.....276
W8KML.....274
W6AM.....274
W6YY.....273

From April 1, to May 1, 1959 DXCC certificates and endorsements based on postwar contacts with 100-or-more countries have been issued by the ARRL Communications Department to the amateurs listed below.

NEW MEMBERS

VK4FJ.....241
F3YR.....229
W5PQA.....224
ZP5CF.....216
W5VU.....213
W3LMO.....207
DL3DU.....204
W1OGU.....165
W3MVQ.....150
W1AIN.....132
W5II.....130
W6OHX.....126
CX9AJ.....124
VS1JF.....123
W9AZI.....120
W3JVA.....113
K5AUZ.....113
W7OEV.....113
W2LNB.....112
K9ENB.....112
G3LPA.....112
W9LJU.....111
ZS4IO.....111
K8IKB.....110
W0NGM.....110
DL3ZA.....108
ZS2JA.....108
W4MS.....107
DJ2KS.....107
HB9IK.....107
SM1BVQ.....107
W6TYQ.....105
GW3BNQ.....105
SM3BNL.....105
W2ONQ.....103
JA1CC.....103
K4RBV.....102
W6AJP.....102
W6ETU.....102
W7CWE.....102
W0RQS.....102
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Mrs. Helen M. Maillet, W7GGV,
SCM of Idaho

the transmissions are given below. These make it possible to check your copy. For practice purposes, the order of words in each line of *QST* text sometimes is reversed. To improve your fist, hook up your own key and audio oscillator and attempt to send in step with W1AW.

Date	Subject of Practice Text from May *QST*
July 3:	*1958 Sweepstakes C.W. Results*, p. 52
July 7:	*DXpedition . . .* , p. 80
July 10:	*The Amateur and Public Relations*, p. 82
July 14:	*Russia's Electronic "Iron-Curtain,"* p. 86
July 16:	*History in the Making*, p. 92
July 20:	*The World Above 20,000 Mc.*, p. 11
July 28:	*"Monitrol" — A Station Control Center*, p. 17
July 29:	*Self-Supporting Tower . . .* , p. 26

MEET THE SCMs

Mrs. Helen M. Maillet, W7GGV, one of Pocatello's three women hams and Idaho's new SCM, became interested in amateur radio in 1953 when she was secretary for a radio-television service shop where all the technicians were hams. Three years later she received her Novice Class license and the following year her Conditional. KN7CXP, her OM, has taken his exam and quite likely has dropped the "N" at this reading.

Helen is a member of the Pocatello Amateur Radio Club, Idaho Radio Amateurs, Inc., YLRL, RACES and AREC, checks into the YL Hairpin and Cross Country Nets and has participated in YL Anniversary and YL/OM Parties.

Among the honors she has won are RCC, WAS, YLCC and Gaylark certificates and was elected as vice-president of the WIMU (Wyoming-Idaho-Montana-Utah) Hamfest, which is scheduled to be held the first week end in August. She has assisted in introducing ham radio to Cub Scouts.

W7GGV's ham equipment includes a Viking II and a Babcock rig, as well as an SX-101 receiver. Also available for mobile work are a Babcock D transmitter Model MT-5B, a Morrow FTR and a 5BR-1 converter. Dipoles are utilized for 80, 40 and 15 meters and Wonder Bar bow-ties for 20 and 10.

When not occupied with ham radio, Helen enjoys ceramics and sewing.

BRIEFS

Reminder: To assure listing in the official *QST* report, Field Day logs must be postmarked by July 25. Please read the rules in last month's issue (p. 64) carefully before submitting your entry.

—···—

Right at press time, the Papua and New Guinea Division of the Wireless Institute of Australia announces sponsorship of a VK9 3.5-Mc. contest to be held July 1 through 31. Its purpose is "encourage wider use of one of our sparsely-populated bands," says Secretary VK9AU. Any amateur may work those in Papua or New Guinea on either phone or c.w. or both, and one contact per station daily (phone or c.w.) is permitted. While few of the W/VE contingent can be expected to hear VK9s during the summer static crashes on the 80-meter band, we are happy to pass along the above information for whatever it is worth.

—···—

The 1959 VK/ZL DX Test comes up Oct. 3–4 and 10–11.

BRASS POUNDERS LEAGUE

Winners of BPL Certificates for April traffic:

Call	*Orig.*	*Recd.*	*Rel.*	*Del.*	*Total*
W2KEB	242	1726	1369	233	3570
W7BA	21	1046	1011	33	2111
W3CUL	243	991	542	329	2105
W0BDR	34	762	699	17	1512
K4BUJ	24	677	631	22	1354
W0LGG	39	489	667	21	1216
W8UPH	14	573	542	30	1159
W9NZZ	249	417	0	417	1083
K2UTV	108	487	472	15	1082
W6GYH	146	422	423	12	1003
W7PGY	34	471	439	22	966
K6LVR	25	487	390	17	919
K6HLR	46	419	342	25	832
W6EOT	12	398	334	31	775
W0CBI	4	375	342	33	754
K4VDL	28	368	343	3	742
K4SJH	76	348	288	29	741
W0BLI	4	364	357	4	729
K5FHU	42	341	258	83	724
W5RCF	36	349	301	36	722
W0LCX	25	342	339	8	714
W7ZB	14	347	340	7	708
K2SIL	7	347	343	5	702
W1AWA	6	346	322	7	681
W9IDA	10	321	319	2	652
W9DO	12	297	31	278	618
K6GK	25	290	180	110	605
K1GRP	42	265	245	20	572
K1BCS	135	219	160	55	569
K2QBW	19	272	228	38	557
W8SMK	83	235	176	59	553
K6OZJ	5	266	251	15	537
K1CIF	106	207	193	21	527
K9DAC	40	242	230	12	524
K0HHG	102	209	208	1	520
W7BDU	2	254	242	8	506
Late Reports:					
W6GYH (Mar.)	187	296	409	11	903
K6HLR (Mar.)	67	435	359	26	887
K6LVR (Mar.)	12	403	391	4	810
K5FHU (Mar.)	2	391	356	35	784
W0OHJ (Feb.)	8	318	331	8	665
K4QES (Mar.)	138	220	212	5	575

More-Than-One-Operator Stations

Call	*Orig.*	*Recd.*	*Rel.*	*Del.*	*Total*
W4PFC	17	1046	1034	12	2109
W6YDK	761	405	378	24	1568
KG1DT	179	161	25	136	501
Late Reports:					
K6MCA (Mar.)	34	610	582	28	1254
K6MCA (Jan.)	23	614	588	26	1251
K6MCA (Feb.)	83	521	485	36	1125
W6ZJB (Mar.)	185	491	345	19	1040
W6ZJB (Feb.)	222	379	262	13	876

BPL for 100 or more *originations-plus-deliveries*

K4QLG 293	K6GZ 127	K2MIG 105
K4ZMT 229	KN9PCS 122	K2VVL 104
K4CNY 193	K1ADH 121	W9PCQ 104
W7YHS 187	W1EUT 121	WV2AYI 103
KN1IHA 152	W9ETM 121	K1IIK 101
K7AEZ 145	W9TT 119	K2IZN 100
K2GQO 143	W8DAE 118	
W6BHG 141	K6PZM 113	Late Reports:
K2SSX 136	K1CMS 111	K5KBQ (Mar.) 128
W4PXX 133	K2ZHK 111	K5ETM (Mar.) 102

More-Than-One-Operator Stations

W4SKH 145

A BPL medallion (see Aug. 1954 QST, p. 64) has been awarded to the following amateur since last month's listing: W0OME

The BPL is open to all amateurs in the United States, Canada, Cuba and U. S. possessions who report to their SCM a message total of 500 or more or 100 or more originations plus deliveries for any calendar month. All messages must be handled on amateur frequencies within 48 hours of receipt, in standard ARRL form.

• All operating amateurs are invited to report to the SCM on the first of each month, covering station activities for the preceding month. Radio Club news is also desired by SCMs for inclusion in these columns. The addresses of all SCMs will be found on page 6.

ATLANTIC DIVISION

EASTERN PENNSYLVANIA—SCM, Richard B. Mesirov, W3JNQ—RM: AXA. PAM: TEJ. PEN meets Mon. through Fri. at 1800 on 3850 kc. E.Pa. meets Mon. through Sun. at 1830 on 3610. New appointments: HUS and K3ALD as OOs; KMD and K3ANU as ORSs. MFW competed in his first CD Party. FCI will spend the summer in Beach Haven Crest driving a laundry truck. FKE is back on the air after a two-week stay in the hospital. K3IDZN was QRT because of school. KJJ reports formation of the Panther Valley Wireless Assn. in the Tamaqua Area, with RZV as pres.; ZPW, vice-pres.; and CPR, secy-treas. HNK is now located in Glenolden. K3ANS received a 3RN certificate. CUL reports that summer static is forcing her to use 40 meters more, and that Daylight Time throws her skeds off. K3ALD is concentrating on DX and contests. IVS visited at the Old Timers Banquet in Trenton. JPV made WAS. K3AHT won the Pennsylvania award for the Minn. QSO Party and received W-DEL. ADE gave his new HQ-160 a workout in the April CD Party. FYD is threatening to hook a mike up to his Ranger. FWI is finishing an Apache for his home QTH. NWJ has a new Impala Chevy (a new kind of rig?). KJ qualified for the Cradle of Democracy Award on phone. BNR reports that the PFN Picnic will be held at Hershey Park Sun., Aug. 23. UIU was in the CD Party and the New Hampshire QSO Party. K3ECB has a new four-element 6-meter beam on a 30-ft. tower. IXL has a new 20-ft. tower adorned by a four-element 6-meter beam plus a Mosley vertical for 10 through 40 meters. This will be the last column written by NJQ, as Al Breiner, ZRQ has been elected SCM for a two-year term. All mail, etc., should be sent direct to him at 212 Race St., Tamaqua, effective immediately. I would like to thank all of the gang for the terrific cooperation during the past two years, which made this column a success (I hope!) and to wish Al good luck with his new job. If he receives as much help from everyone as I did he will have no complaints. Thanks again to all who sent in condolences during the eye seige over the past months. 73 to all. Traffic: W3CUL 2105, IVS 316, K3AHT 168, W3BNR 161, NNL 95, K3DFS 88, DZB 80, W3UIU 80, K3ANU 57, W3TEJ 56, ZLP 30, BUR 24, KMD 24, BFF 22, K3ALD 18, ANS 18, W3FCI 13, NF 13, FKE 12, HNK 10, NQB 6, ELI 4, K3DZN 3, W3LHA 2.

MARYLAND-DELAWARE-DISTRICT OF COLUMBIA—SCM, Arthur W. Plummer, W3EQK—SEC: PKC. ECs: WG, Calvert County; VVP, Talbott County; FNM, Garrett County; CVE, Prince George County; ECP, Washington, D. C.; FUR, St. Mary's County; FVK, Carroll County; JME, Baltimore County; MAZ, Baltimore City; OMN, Montgomery County. BVL reports that B&O ARC certificates went to NAV, MAH, DXL and 8RIN. K8KZF took over as B&O Net NCS. KN3HPE is watching the mailbox for his General Class ticket. TSC worked 225 stations in the YL-OM Contest. BKE is resting up after the DX Contest. IZF, the Telephone Pioneers Amateur Radio Club, has a new three-element tri-band beam on top of one of the phone company buildings, as reported by ROS, secy. K3DIW and his XYL, K3EFU, had a surprise "stork shower" attended by K3GDB and XYL, K3EIZ and XYL and son, K3EIY, K3CQE and XYL, BQM and XYL and K3EJR and XYL. K3EIZ has started code classes for Novice and Technicians at local UAW 738 Union Hall. K2JCS/4 wants to know if there is a special certificate for working Baltimore stations. Sorry, Al, there is none but there is an idea! New officers of the RCARA are MKS, pres.; PZZ, 1st vice-pres.; MUA, 2nd vice-pres.; K3CJM, secy.; and FWP, treas. K3EKO, ex-6ZKL, ex-1DIJ, recently worked 14 countries with 5 watts on 21 Mc. EQK made arrangements for a tour of NSS at Annapolis which was attended by MAZ and XYL, PSP, DMW, NPL, BKT, KDD, K3EFR and K3AVT. Our host was LCDR. C. W. Postlethwaite. K3BYR will be in Mt. Wilson Hospital for nine months or more. ZCK is on 2 meters with a Communicator issued him by Baltimore C.D. JJC can be heard on the air with his new EICO equipment on 10 and 15 meters. It is reported JCL smiled the other day (they said it couldn't be done!). We hope CAY will have his new Collins gear soon. CCU is a newcomer to the 29.5-Mc. net. FKM is mounting 10- and 15-meter beams on a 30-ft. pole. ZCM is back on his feet after a week in the hospital. BOM is quite an efficient botanist and has a greenhouse alongside his QTH. K3DHQ should be on with RTTY by this time. ZA, still in Saigon, operated XV5A then ZA/3 but expects a new call soon. He will leave in June for three months' leave Stateside then return to Saigon in Sept. RV, who was well known while at Andrews Air Force Base, is now in Fairbanks, Alaska. 4TVT gave talk on Trinidad to WAYLARC members at the April meeting. AKB's overtime work keeps her away from the "rig." RXJ is learning about gold and uranium mining from a ZS6. UTR reports that KØLYV expects to move from Iowa to Dallas, Tex., this summer. JNX reports that NNM is pres. of the new Free State Amateur Radio Club at Fort George G. Meade operating under the temporary call 4LOI. 4YWF is Washington Mobile Radio Club pres.; with ADD as vice-pres.; 4ZLN, act. mgr.; 4IKK, rec. secy.; and IN, treas. SFY should have his new 60-ft. tower up by now. HB, HEQ, EHM and K3CFD are new paid-up members of the RCARA. RCN, the RCARA's new 6-meter net, is now on at 7 P.M. each Tue. with YAG as NCS. K3DGK and K4SSA, chairman and co-chairman respectively of the Red Cross Blood Drive in D. C., did an FB job with 19 mobile units transporting 14 blood donors to the Red Cross Bldg. from their homes and back again. National Capital V.H.F. Society has taken part in a most commendable undertaking and is to be congratulated. New licensees in the Hagerstown Area are KNs 3HPF, HPH, HPG, HRM, GMU, HKE, HJE and EXH. VAM had a new jr. harmonic Mar. 27. The ARA will miss NHR, who has moved to Fort Belvoir. GVN finally got his Apache running right. K3ANA's OM has curtailed his hamming time. Reason? One "D" on the ol' report card. The MDDS has ceased operation for the summer. The newly-formed St. Mary's Amateur Radio Club meets the last Tue. of each month. BUD is pres.; GGA, vice-pres.; BCP, secy.-treas. BKE was in the April CD Party. HKS took part in the RACES drill. EOV operates from home week ends and from DAG during the week. FKM is busy organizing a v.h.f. medical net in Baltimore to work in conjunction with the Red Cross and c.d. PZW is Asst. Mgr. of 3RN. All traffic nets will continue during the summer except MDD. The PVRC entertained the Frankford Radio Club at the home of GRF. Traffic: (Apr.) W3UE 307, AHQ 191, K3ANA 188, WBJ 142, W3TN 114, PQ 84, NNM 61, BUD 57, EOV 25, W1HBO/3 19, W3BKE 4, WSE 3. (Mar.) K3ANA 153, W3COK 51, NNM 49, IWJ 38, BKE 6, JZY 6.

SOUTHERN NEW JERSEY—SCM, Herbert C. Brooks, K2BG—SEC: W2YRW. RMs: W2BZJ, W2HDW, W2YRW and W2ZI. W2LY, Merchantville, and K2HHO, Oaklyn, are hospitalized. We wish them a speedy recovery. WA2ABF has been added to SJRA's *Harmonics* editorial staff. K2OOK expects to be signing slant 8 from June until January. W2ZI, chief opr., State Control Center, reports the following manned the Hq. station: W2BZJ, W2SUG, K2DSL, W2ISZ, K2GHJ, W3BCJ and K2AAR. K2CPR's DX total is now 248/239. W2BZJ, the DVRA' secy., reports the club's April activities included another fine "Old Timers Nite." W2SXV is starting a code class to assist new club members. K2HW reports the successful participation of Mercer County RACES in the recent test. K2SVD and W2FZP are heard on 10 meters. W2VCX, K2CPR and K2YYB took part in the recent F.M.T. W2RXL, NJN's manager, reports the April traffic total as 404. Congratulations to K2MBT and K2DEI on their part in presenting a TV program over WCAU entitled "Ham Radio Operators." It was a very fine public relations effort. Your SEC and SCM attended the Tri-City Amateur Radio Club meeting at Millville. K2EFA is the Cumberland County EC. W2OSD is SJRA's Field Day chairman. K2ECY is now located in Riverton. The Burlington Co. Radio Club meets in Moorestown the 1st Fri. Appointees are urged to send

(Continued on page 104)

VISITING THE DAYTON HAMVENTION MAY 8TH AND 9TH

FIRST, of course, there was "Butch", KØDWC, and his charming wife "Jeff". His speech at the banquet Saturday night was the first clear picture most of us had ever heard of the international crisis.

THEN K4BMR and W1AEO. Their talks were highlights of the Hamvention. And as if you didn't know, they are, in that order, Lieutenant General Francis Griswold, Brigadier General John Bestic and Major Gene McElroy — all USAF and all enthusiastic and active hams.

THERE were all manner of SSB, AM and CW enthusiasts from all over the world it seemed; DX men and women, VHF fans — yes, 2,500 amateurs and friends all told. It was quite a get-together and the committee responsible is to be warmly complimented on a job very well done.

JACK DOYLE, W9GPI, "Bud" Budlong, W1BUD, Trav Marshall, K9EBE, and I had an until-the-dawn discussion of many matters concerning ham radio.

SITTING in for part of our discussion was Danny Weil, VP2DW, and about 10 other calls. Conversation got around to Dick, KV4AA, and what a job he's doing for amateur radio — for DX and CW in particular.

WE ALL seemed to feel there is a resurgence of interest in CW, brought about perhaps by Electronic keying. I've heard W6UF, W9AIO, W9FKC and a few others working their keyers and their sending is a joy to hear. "Al," W8DUS, and I have our orders in, but up to this writing neither of us has had delivery. When we get 'em you'll be hearing us, you may be sure.

AND YOU'LL be hearing more about CW on this page, too — with due respect to the other modes of communication. CW, with a keyer, appears like a new challenge to the old, old timers. Maybe they want to live it up while there is yet time!

— BILL HALLIGAN, W9AC

Bill Halligan Jr. W. J. Halligan W9AC for hallicrafters

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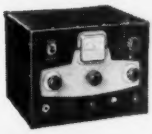
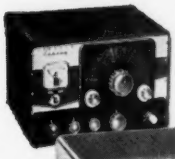


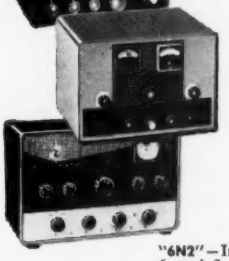
"ADVENTURER"—50 watts CW input, bandswitching 160 through 10 meters. With tubes.

Cat. No.	Amateur Net
240-181-1..Kit	$54.95.



"NAVIGATOR"—40 watts CW input—serves as a flexible VFO/Exciter. Built-in VFO. With tubes.

Cat. No.	Amateur Net
240-126-1..Kit	$149.50
240-126-2..Wired	$199.50



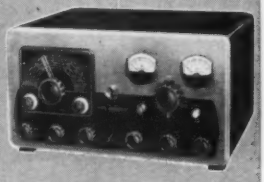
"CHALLENGER"—70 watts AM input 80 through 6, 120 watts CW input 80 thru 10 —85 watts on 6. With tubes.

Cat. No.	Amateur Net
240-782-1..Kit ...	$114.75
240-182-2..Wired .	$154.75

Yes, whether you're looking for flexibility, performance, initial dollar value, or high trade-in value —you'll get more in a Viking. First choice among the nation's amateurs, Viking transmitters are far and away your best buy! Visit your authorized Johnson distributor today to see the complete line of Viking Amateur Transmitters—or write for your free copy of our newest amateur equipment catalog, listing complete specifications, schematics, and prices, on all Johnson amateur equipment and accessories.

"6N2"—Instant bandswitching 6 and 2 meters. Rated 150 watts CW and 100 watts AM phone. With tubes.

Cat. No.	Amateur Net
240-201-1..Kit	$129.50
240-201-2..Wired	$169.50



"RANGER"—75 watts CW and 65 watts phone input. Bandswitching 160 through 10. Built-in VFO. With tubes.

Cat. No.	Amateur Net
240-161-1..Kit ..	$229.50
240-161-2..Wired	$329.50

"FIVE HUNDRED"—600 watts CW input, 500 watts phone and SSB. (P.E.P. with auxiliary SSB exciter.) Bandswitching 80 through 10 meters. Built-in VFO. With tubes.

Cat. No.	Amateur Net
240-500-1..Kit	$749.50
240-500-2..Wired	$949.50

"KILOWATT" AMPLIFIER—This exciting unit is the only power amplifier available which will deliver full 2000 watts SSB* input and 1000 watts CW and AM! Continuous coverage 3.5 to 30 mcs. Excitation requirements: 30 watts RF and 10 watts audio for AM; 10 watts peak for SSB.

Cat. No.	Amateur Net
240-1000..Wired and tested.....	$1595.00
251-101-1..Matching desk top, back and 3 drawer pedestal..FOB Corry, Pa...	$132.00

**The FCC permits a maximum of one kilowatt average power input for the amateur service. In SSB operation under normal conditions this results in peak envelope power inputs of 2000 watts or more depending upon individual voice characteristics.*

New Catalog

Yes, dollar-for-dollar and feature-for-feature you'll get more of everything in a Viking transmitter . . . that's why Viking transmitters outsell all others! Write for your free Viking Amateur Catalog and you'll soon see why your best transmitter buy is a Viking!

Viking

FIRST CHOICE AMONG THE NATION'S AMATEURS

BUILD YOUR OWN HEATHKIT® HAM GEAR

HEATHKIT HAM EQUIPMENT IS DESIGNED BY HAMS WHO KNOW YOUR PROBLEMS AND NEEDS.

PROVEN, "ON THE AIR" PERFORMANCE

"SENECA" VHF HAM TRANSMITTER KIT

Beautifully styled and a top performer of highest quality throughout. The "Seneca" is a completely self-contained 6 and 2 meter transmitter featuring a built-in VFO for both 6 and 2 meters, and 4 switch-selected crystal positions, 2 power supplies, 5 radio frequency stages, and 2 dual-triode audio stages. Panel controls allow VFO or crystal control, phone or CW operation on both amateur bands. An auxiliary socket provides for receiver muting, remote operation of antenna relay and remote control of the transmitter such as with the Heathkit VX-1 Voice Control. Features up to 120 watts input on phone and 140 watts on CW in the 6 meter band. Ratings slightly reduced in the 2 meter band. Ideal for ham operators wishing to extend transmission into the VHF region. Shpg. Wt. 56 lbs.

HEATHKIT VHF-1 $159.95

HEATHKIT DX-20 $35.95

DX-20 CW TRANSMITTER KIT

Designed exclusively for CW work, the DX-20 provides the novice as well as the advanced-class CW operator with a low cost transmitter featuring high operating efficiency. Single-knob bandswitching covers 80, 40, 20, 15 and 10 meters using crystals or an external VFO. Pi network output circuit matches antenna impedances between 50 and 1,000 ohms. Employs a single 6DQ6A tube in the final amplifier stage for plate power input of 50 watts. A 6CL6 serves as the crystal oscillator. The husky power supply uses a heavy duty 5U4GB rectifier and top-quality "potted" transformer for long service life. Easy-to-read panel meter indicates final grid or plate current selected by the panel switch. Complete RF shielding to minimize TVI interference. Easy-to-build with complete instructions provided. Shpg. Wt. 19 lbs.

HEATH COMPANY Benton Harbor, Michigan a subsidiary of Daystrom, Inc.

Mobile Gear...for the Ham on the Go!

"CHEYENNE" MOBILE HAM TRANSMITTER KIT

All the fun and excitement . . . plus the convenience of mobile operation are yours in the all-new Heathkit "Cheyenne" transmitter. The neat, compact, and efficient circuitry provides you with high power capability in mobile operation, with low battery drain using carrier controlled modulation. All necessary power is supplied by the model MP-1 described below. Covers 80, 40, 20, 15 and 10 meters with up to 90 watts input on phone. Features built-in VFO, modulator, 4 RF stages, with a 6146 final amplifier and pi network (coaxial) output coupling. High quality components are used for long service life and reliable operation, along with rugged chassis construction to withstand mobile vibrations and shock. Thoughtful circuit layout provides for ease of assembly with complete instructions and detailed pictorial diagrams to insure success. A spotting switch is also provided. A specially designed ceramic microphone is included to insure effective modulation with plenty of "punch". Plan now to enjoy the fun of mobile operation by building this superb transmitter. Shpg. Wt. 19 lbs.

HEATHKIT MT-1
$99.95

"COMANCHE" MOBILE HAM RECEIVER KIT

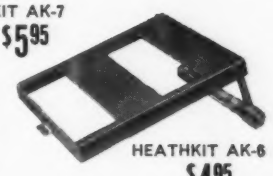
Everything you could ask for in modern design mobile gear is provided in the "Comanche" . . . handsome styling, rugged construction, top quality components . . . and, best of all, a price you can afford. The "Comanche" is an 8-tube superheterodyne ham band receiver operating AM, CW and SSB on the 80, 40, 20, 15 and 10 meter amateur bands. A 3 mc crystal lattice-type IF filter permits the receiver to use single conversion without image interference, and at the same time creates a steep sided 3 kc flat top IF bandpass characteristic comparable to mechanical type filters. The neat, compact and easy-to-assemble circuitry features outstanding sensitivity, stability and selectivity on all bands. Circuit includes an RF stage, converter, 2 IF stages, 2 detectors, noise limiter, 2 audio stages and a voltage regulator. Sensitivity is better than 1 microvolt on all bands and signal-to-noise ratio is better than 10 db down at 1 microvolt input. One of the finest investments you can make in mobile gear. Shpg. Wt. 19 lbs.

HEATHKIT MR-1
$119.95

MOBILE SPEAKER KIT

A matching companion speaker for the "Comanche" mobile receiver. Housed in a rugged steel case with brackets provided for easy installation on fire wall or under dashboard, etc. Uses 5 PM speaker with 8 ohm voice coil. Measures 5" H. x 5" W. x 2½" D. Shpg. Wt. 4 lbs.

HEATHKIT AK-7
$5.95



HEATHKIT AK-6
$4.95

MOBILE BASE MOUNT KIT

The AK-6 Base Mount is designed to hold both transmitter and receiver conveniently at driver's side. Universal mounting bracket has adjustable legs to fit most automobiles. Shpg. Wt. 5 lbs.

HEATHKIT MP-1
$44.95

MOBILE POWER SUPPLY KIT

This heavy duty transistor power supply furnishes all the power required to operate both the MT-1 Transmitter and MR-1 Receiver. It features two 2N442 transistors in a 400 cycle switching circuit, supplying a full 120 watts of DC power. Under intermittent operation it will deliver up to 150 watts. Kit contains everything required for complete installation, including 12' of heavy battery cable, tap-in studs for battery posts, power plug and 15' of connecting cable. Chassis size is 9 1/16" L. x 4¾" W. x 2" H. Operates from 12-14 volt battery source. Circuit convenience provided by self-contained relay which allows push-to-talk mobile operation. Shpg. Wt. 8 lbs.

POWER METER KIT

HEATHKIT PM-2
$12.95

This handy unit picks up energy from your mobile antenna and indicates when your transmitter is tuned for maximum output. A variable sensitivity control is provided. Features a strong magnet on a swivel-mount for holding it on a car dashboard or other suitable spot. Has its own antenna or may be connected to existing antenna. Sensitive 200 ua meter. Shpg. Wt. 2 lbs.

HEATHKIT

COMPANION UNITS

HEATHKIT TX-1 $234.95

"APACHE" HAM TRANSMITTER KIT

The many features and modern styling of the "Apache" will provide you with just about everything you could ask for in transmitting facilities. Emphasizing high quality the "Apache" operates with a 150 watt phone input and 180 watt CW input. In addition to CW and phone operation, built-in switch selected circuitry provides for single-sideband transmission using the SB-10 External adapter. The newly designed, compact and stable VFO provides low drift frequency control necessary for SSB transmission. A slide rule type illuminated rotating VFO dial with full gear drive vernier tuning provides ample bandspread and precise frequency settings. The bandswitch allows quick selection of the amateur bands on 80, 40, 20, 15 and 10 meters. This unit also has adjustable low-level speech clipping and a low distortion modulator stage employing two of the new 6CA7/EL34 tubes in push-pull class AB operation. Time sequence keying is provided for "chirpless" break-in CW operation. The final amplifier is completely shielded for TVI protection and neutralized for greater stability. A cooling fan is also provided. The formed one-piece cabinet with convenient access hatch provides accessibility to tubes and crystal sockets. Die-cast aluminum knobs and control panel escutcheons add to the attractive styling of the transmitter. Pi network output coupling matches antenna impedances between 50 and 72 ohms. A "spotting" push button enables the operator to "zero beat" an incoming frequency without putting the transmitter on the air. Equip your ham shack now for top transmitting enjoyment with this outstanding unit. Shpg. Wt. 110 lbs. Shipped motor freight unless otherwise specified.

HEATHKIT SB-10 $89.95

SINGLE SIDEBAND ADAPTER KIT

Designed as a compatible plug-in adapter unit for the TX-1 "Apache" transmitter, this unit lets you operate on SSB at a minimum of cost, yet does not affect the normal AM and CW functions of the transmitter. By making a few simple circuit modifications, the DX-100 and DX-100-B transmitters can be used, utilizing all existing RF circuitry. Extremely easy to operate and tune, the adapter employs the phasing method for generating a single-sideband signal, thus allowing operation entirely on fundamental frequencies. The critical audio phase shift network is supplied completely preassembled and wired in a sealed plug-in unit. Produces either a USB, LSB or DSB signal, with or without carrier insertion. Covers 80, 40, 20, 15 and 10 meter bands. An easy-to-read panel meter indicates power output to aid in tuning. A built-in electronic voice control with anti-trip circuit is also provided. 10 watts PEP output. Unwanted sideband suppression is in excess of 30 db and carrier suppression is in excess of 40 db. An EL84/6BQ5 tube is used for linear RF output. Shpg. Wt. 12 lbs.

MODIFICATION KIT: Modifies DX-100 and DX-100-B for use with the SB-10 Adapter. Model MK-1. Shpg. Wt. 1 lb. $8.95.

HEATHKIT AR-3 $29.95

(less cabinet)

ALL-BAND RECEIVER KIT

A fine receiver for the beginning ham or short wave listener, designed for high circuit efficiency and easy construction. Covers 550 kc to 30 mc in four bands clearly marked on a slide-rule dial. Transformer operated power supply. Features include: bandswitch, bandspread tuning, phone-standby-CW switch, phone jack, antenna trimmer, noise eliminator, RF gain control and AF control. Shpg. Wt. 12 lbs.

CABINET: Opt. extra. No. 91-15A. Shpg. Wt. 5 lbs. $4.95.

HEATHKIT QF-1 $9.95

"Q" MULTIPLIER KIT

Useful on crowded phone and CW bands, this kit adds selectivity and signal rejection to your receiver. Use it with any AM receiver having an IF frequency between 450 and 460 kc that is not AC-DC type. Provides an effective "Q" of approximately 4,000 for extremely sharp "peak" or "null". The QF-1 is powered from the receiver with which it is used. Shpg. Wt. 3 lbs.

OF DISTINCTIVE QUALITY

ACCESSORY SPEAKER KIT

Handsomely designed and color styled to match the "Mohawk" receiver this heavy duty 8" speaker with 4.7 ounce magnet provides excellent tone quality. Housed in attractive ⅜" plywood cabinet with perforated metal grille. Speaker impedance is 8 ohms. Shpg. Wt. 7 lbs.

HEATHKIT AK-5
$9.95

HEATHKIT RX-1 $274.95

"MOHAWK" HAM RECEIVER KIT

Styled to match the "Apache" transmitter the "Mohawk" ham band receiver provides all the functions required for clear, rock-steady reception. Designed especially for ham band operation this 15-tube receiver features double conversion with IF's at 1682 kc and 50 kc and covers all the amateur frequencies from 160 through 10 meters on 7 bands with an extra band calibrated to cover 6 and 2 meters using a converter. Specially designed for single sideband reception with crystal controlled oscillators for upper and lower sideband selection. A completely preassembled wired and aligned front end coil bandswitch assembly assures ease of construction and top performance of the finished unit. Other features include 5 selectivity positions from 5 kc to 500 CPS, bridge T-notch filter for excellent heterodyne rejection, and a built-in 100 kc crystal calibrator. The set provides a 10 db signal-to-noise ratio at less than 1 microvolt input. Each ham band is separately calibrated on a rotating slide rule dial to provide clear frequency settings with more than ample bandspread. Front panel features S-meter, separate RF, IF and AF gain controls, T-notch tuning, T-notch depth, ANL, AVC, BFO, Bandswitch tuning, antenna trimmer, calibrate set, calibrate on, CW-SSB-AM, receive-standby, upper-lower sideband, selectivity, phone jack and illuminated gear driven vernier slide rule tuning dial. Attractively styled with die-cast aluminum control knobs and escutcheons. No external alignment equipment is required for precise calibration of the "Mohawk". All adjustments are easily accomplished using the unique method described in the manual. An outstanding buy in a communications receiver. Shpg. Wt. 66 lbs. Shipped motor freight unless otherwise specified.

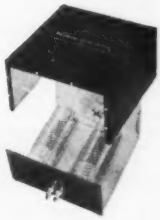
HEATHKIT AM-2
$15.95

REFLECTED POWER METER KIT

The AM-2 measures forward and reflected power or standing wave ratio. Handles a peak power of well over 1 kilowatt of energy and covers 160 through 6 meters. Input and output impedance provided for 50 or 75 ohm lines. No external power required for operation. Use it also to match impedances between exciters or RF sources and grounded grid amplifiers. Shpg. Wt. 3 lbs.

BALUN COIL KIT

Match unbalanced coaxial lines, found on most modern transmitters, to balanced lines of either 75 or 300 ohms impedance with this handy transmitter accessory. Capable of handling power input up to 200 watts, the B-1 may be used with transmitters and receivers covering 80 through 10 meters. No adjustment required. Shpg. Wt. 4 lbs.



HEATHKIT B-1
$8.95

HEATHKIT VX-1
$23.95

ELECTRONIC VOICE CONTROL KIT

Eliminate hand switching with this convenient kit. Switch from receiver to transmitter by merely talking into your microphone. Sensitivity controls allow adjustment to all conditions. Power supply is built in and terminal strip on the rear of the chassis accommodates receiver and speaker connections and also a 117 volt antenna relay. Shpg. Wt. 5 lbs.

HEATHKIT VF-1
$19.50

VFO KIT

Far below the cost of crystals to obtain the same frequency coverage this variable frequency oscillator covers 160, 80, 40, 20, 15 and 10 meters with three basic oscillator frequencies. Providing better than 10 volt average RF output on fundamentals, the VF-1 is capable of driving the most modern transmitters. Requires only 250 volts DC at 15 to 20 ma, and 6.3 VAC at 0.45 a. Illuminated dial reads direct. Shpg. Wt. 7 lbs.

Save 1/2 or more...with Heathkits

HEATHKIT DX-100-B **$189.50**

DX-100-B PHONE AND CW TRANSMITTER KIT

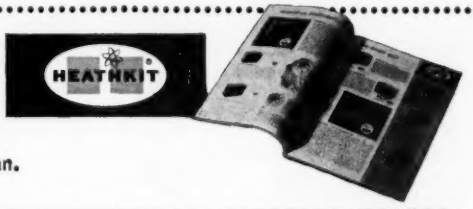
A long standing favorite in the Heathkit line, the DX-100-B combines modern styling and circuit ingenuity to bring you an exceptionally fine transmitter at an economical price. Panel controls allow VFO or crystal control, phone or CW operation on all amateur bands up to 30 mc. The rugged one-piece formed cabinet features a convenient top-access hatch for changing crystals and making other adjustments. The chassis is punched to accept sideband adapter modifications. Featured are a built-in VFO, modulator, and power supply, complete shielding to minimize TVI, and a pi network output coupling to match impedances from 50 to 72 ohms. RF output is in excess of 100 watts on phone and 120 watts on CW. Band coverage is from 160 through 10 meters. For operating convenience single-knob bandswitching and illuminated VFO dial on meter face are provided. A pair of 6146 tubes in parallel are employed in the output stage modulated by a pair of 1625's. Shpg. Wt. 107 lbs. Shipped motor freight unless otherwise specified.

HEATHKIT DX-40 **$64.95**

DX-40 PHONE AND CW TRANSMITTER KIT

An outstanding buy in its power class the DX-40 provides both phone and CW operation on 80, 40, 20, 15 and 10 meters. A single 6146 tube is used in the final amplifier stage to provide full 75 watt plate power input on CW or controlled carrier modulation peaks up to 60 watts for phone operation. Modulator and power supplies are built in and single-knob bandswitching is combined with the pi network output circuit for complete operating convenience. Features a D'Arsonval movement panel meter. A line filter and liberal shielding provides for high stability and minimum TVI. Provision is made for three crystals easily accessible through a "trap door" in the back of the cabinet. A 4-position switch selects any of the three crystals or jack for external VFO. Power for the VFO is available on the rear apron of the chassis. Easy-to-follow step-by-step instructions let assembly proceed smoothly from start to finish even for an individual who has never built electronic equipment before. Shpg. Wt. 25 lbs.

Free Send now for latest Heathkit Catalog describing in detail over 100 easy-to-assemble kits for the Hi-Fi fan, radio ham, boat owner and technician.



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a subsidiary of Daystrom, Inc.

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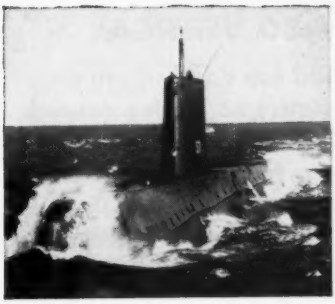
All prices and specifications subject to change without notice. Please include postage on orders to be shipped parcel post. 20% deposit is required on all C.O.D. orders. All prices are NET F.O.B. Benton Harbor, Mich., and apply to Continental U.S. and Possessions only.

NAME _____

ADDRESS _____

CITY _____ ZONE _____ STATE _____

QUANTITY	KIT NAME	MODEL NO.	PRICE



FIELD ENGINEERING WITH A FUTURE

in Raytheon's Sonar Programs for the U.S. Navy

BILL WILKINSON, W1HA—former sonar field engineer—is now a division staff engineer with Raytheon's Government Services Division. One of Bill's present assignments is with the most comprehensive underwater sonar system yet devised—Raytheon's AN/BQQ-1 for the Navy.

Even in the Navy, submarine duty is experienced by a select few. Bill Wilkinson, W1HA, and a special crew of Raytheon field engineers belong to this exclusive club and find the experience interesting and stimulating.

Bill—who points out that Raytheon field engineering experience has been a valuable asset in his career—is now a division staff engineer with overall responsibilities for sonar field engineering. Many Raytheon executives have been appointed to their present positions from field engineering assignments.

In addition to the sonar program, there are Raytheon field engineering opportunities in missiles, fire control, ground and bombing radar, radar countermeasures. To qualify, you should have field experience in one or more of these fields—and preferably an EE degree.

Benefits: attractive salary, assistance in relocating, insurance, educational programs. You'll join a friendly group and a long list of hams around the world.

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Government Services Division
100 River Street, Waltham, Mass.

IS K6INI THE WORLD'S CHAMPION DX OPERATOR?

Judge for yourself! Read his letter and count the DX he has worked—with only 65 watts and a $16.95 Gotham V-80 Vertical Antenna.

2405 Bowditch, Berkeley 4, California
January 31, 1959

GOTHAM
1805 Purdy Avenue
Miami Beach 39, Florida

Gentlemen:

I just thought I would drop you a line and let you know how pleased I am with your V-80 vertical antenna. I have been using it for almost two years now, and am positively amazed at its performance with my QRP 65 watts input! Let me show you what I mean:

I have worked over 100 countries and have received very fine reports from many DX stations, including 599 reports from every continent except Europe (589)! I have also worked enough stations for my WAC, WAS, WAJAD and ADXC awards, and I am in the process of working for several other awards. And all this with your GOTHAM V-80 vertical antenna!

Frankly, I fail to see how anyone could ask for better performance with such low power, limited space and a limited budget. In my opinion, the V-80 beats them all in its class.

I am enclosing a list of DX countries I have worked to give you an idea of what I have been talking about.

Wishing you the best for 1959, I am

Sincerely yours,
Thomas G. Gabbert, K6INI (Ex-TI2TG)

List of 105 countries/stations worked with 65 watts and a V-80 vertical

BV1US	KG4AI	VK3YL
CE3DZ	KG6FAE	VK9XK
ZL5AA	KH6IJ	VK9AT
CO2WD	KL7BUZ	VKØCJ
CN2BK	KM6AX	VP2KFA
CN8FB	KP4ACF	VP2AY
CR9AH	KP6AL	VP2DW
CT1CB	KR6BF	VP2MX
CX2FD	KS4AZ	VP2LU
DL1FF	KV4AA	VP2SW
DU7SV	KW6CA	VP5CP
EA1FD	KX6AF	VP5BH
EI4N	KZ5CS	VP6TR
F8VQ	LA3SG	VP7NM
FB8ZZ	LU2DFC	LU1ZS
FG7XE	LZ1KSP	VP9BK
FK8AL	OA4AU	VR2DA
FM7WT	OE9EJ	VR3B
FO8AD	OH2TM	VS1HC
G3DOG	OK1FF	VS2DW
GC8DO	ON4AY	VS6LN
GI3WUI	KG1AX	XE1PJ
GM3GJB	OZ2KK	XW8AI
GW3LJN	PAØFAB	YN1JW
HA5KBP	PJ5AA	YU3FS
HC4IM	PJ2ME	YV5HL
HC8LUX	PY2EW	ZC5AL
HE9LAC	PYØNE	ZE1JV
HP1LO	SM5AQB	ZK1BS
I1MV	SP6BY	KH6MG/ZK1
JA1ANG	TI2LA	ZK2AD
JZØHA	UA1AU	ZL1ABZ
W1AW	UAØKKB	ZL3JA
KB6BJ	UQ2AB	ZM6AS
KC4AF	VE8OJ	ZS1OU

FACTS
ON THE GOTHAM V-80 VERTICAL

- If K6INI can do it, so can you.
- Absolutely no guying needed.
- Radials not required.
- Only a few square inches of space needed.
- Four metal mounting straps furnished.
- Special B & W loading coil furnished.
- Every vertical is complete, ready for use.
- Mount it at any convenient height.
- No relays, traps, or gadgets used.
- Accepted design—in use for many years.
- Many thousands in use the world over.
- Simple assembly, quick installation.
- Withstands 75 mph windstorms.
- Non-corrosive aluminum used exclusively.
- Omnidirectional radiation.
- Multi-band, V80 works 80, 40, 20, 15, 10, 6.
- Ideal for novices, but will handle a Kw.
- Will work with any receiver and xmitter.
- Overall height 23 feet.
- An effective modern antenna, with amazing performance. Your best bet for a lifetime antenna at an economical price.

73,
GOTHAM

FREE literature? YES
FREE specifications? YES
FREE beam gain calculator? YES

OR ALL THREE AND IMMEDIATE SHIPMENT IF YOU ORDER FROM THIS LIST OF 50 ANTENNAS

Airmail Order Today — We Ship Tomorrow

GOTHAM Dept. QST

1805 PURDY AVE., MIAMI BEACH, FLA.

Enclosed find check or money-order for:

TWO BANDER BEAMS

A full half-wave element is used on each band. No coils, traps, baluns, or stubs are used. No calculations or machining required. Everything comes ready for easy assembly and use. *Proven Gotham Value!*

6–10 TWO BANDER.....	☐	$29.95
10–15 TWO BANDER.....	☐	34.95
10–20 TWO BANDER.....	☐	36.95
15–20 TWO BANDER.....	☐	38.95

TRIBANDER

Do not confuse these full-size Tribander beams with so-called midgets. The Tribander has individually fed (52 or 72 ohm coax) elements and is not frequency sensitive, nor does it have baluns, coils, traps, or other devices intended to take the place of aluminum tubing. The way to work multi-band and get gain is to use a Gotham Tribander Beam.

☐ 6-10-15 $39.95 ☐ 10-15-20 $49.95

2 METER BEAMS

Gotham makes only two different two meter beams, a six-element job and a twelve-element job. They are both Yagi beams, with all the elements in line on a twelve foot boom.

☐ Deluxe 6-Element 9.95 ☐ 12-El 16.95

6 METER BEAMS

New records are being made every day with Gotham six-meter beams. Give your rig a chance to show what it can do, with a Gotham six-meter beam.

☐ Std. 3-El Gamma match	12.95	☐ T match	14.95
☐ Deluxe 3-El Gamma match	21.95	☐ T match	24.95
☐ Std. 4-El Gamma match	16.95	☐ T match	19.95
☐ Deluxe 4-El Gamma match	25.95	☐ T match	28.95

10 METER BEAMS

Ten meter addicts claim that ten meters can't be beaten for all-around performance. Plenty of DX and skip contacts when the band is open, and 30–50 miles consistent ground wave when the band is shut down. Thousands of Gotham ten meter beams have been perking for years, working wonders for their owners, and attesting to the superior design and value of a Gotham beam.

☐ Std. 2-El Gamma match	11.95	☐ T match	14.95
☐ Deluxe 2-El Gamma match	18.95	☐ T match	21.95
☐ Std. 3-El Gamma match	16.95	☐ T match	18.95
☐ Deluxe 3-El Gamma match	22.95	☐ T match	25.95
☐ Std. 4-El Gamma match	21.95	☐ T match	24.95
☐ Deluxe 4-El Gamma match	27.95	☐ T match	30.95

New! Ruggedized Hi-Gain 6, 10, 15 METER BEAMS

Each has a TWIN boom, extra heavy beam mount castings, extra hardware and everything needed. Guaranteed high gain, simple installation and all-weather resistant. For 52, 72 or 300 ohm transmission line. Specify which transmission line you will use.

☐ Beam #R6 (6 Meters, 4-El)....$38.95
☐ Beam #R10 (10 Meters, 4-El).. 40.95
☐ Beam #R15 (15 Meters, 3-El).. 49.95

15 METER BEAMS

Fifteen meters is the "sleeper" band. Don't be surprised if you put out a quick, quiet CQ and get a contact half-way around the world. Working the world with low power is a common occurrence on fifteen meters when you have a Gotham beam.

15 METER BEAMS

☐ Std. 2-El Gamma match	19.95	☐ T match	22.95
☐ Deluxe 2-El Gamma match	29.95	☐ T match	32.95
☐ Std. 3-El Gamma match	26.95	☐ T match	29.95
☐ Deluxe 3-El Gamma match	36.95	☐ T match	39.95

20 METER BEAMS

A beam is a necessity on twenty meters, to battle the QRM and to give your signal the added punch it needs to over-ride the high power boys. Hundreds and hundreds of twenty meter beams, working year after year, prove that there is no better value than a Gotham twenty meter beam.

☐ Std. 2-El Gamma match	21.95	☐ T match	24.95
☐ Deluxe 2-El Gamma match	31.95	☐ T match	34.95
☐ Std. 3-El Gamma match	34.95	☐ T match	37.95
☐ Deluxe 3-El Gamma match	46.95	☐ T match	49.95

(Note: Gamma-match beams use 52 or 72 ohm coax. T-match beams use 300 ohm line.)

ALL-BAND VERTICAL ANTENNAS

You could work the whole world, and get fantastic reports, with a Gotham vertical and only 55 watts, like VP1SD.

You could work tremendous skip and DX, and be surprised at the way your Gotham vertical brings them in, as R. E. C. of Washington, D. C., found out.

You could have a simple, easy-to-install-and-operate vertical antenna, and switch from band to band, as thousands of Gotham customers have done.

☐ **V40 vertical for 40, 20, 15, 10, 6 meters. $14.95**
☐ **V80 vertical for 80, 75, 40, 20, 15, 10, 6 meters.....$16.95**
☐ **V160 vertical for 160, 80, 75, 40, 20, 15, 10, 6 meters.....$18.95**

HOW TO ORDER. Send check or money order directly to Gotham. Immediate shipment by Railway Express, charges collect. Foreign orders accepted.

FREE! WITH EACH ANTENNA OR REQUEST FOR FREE BROCHURE, THE NEW GOTHAM BEAM CALCULATOR.

Name.....

Address.....

City.....Zone.....State.....

Station Activities

(Continued from page 92)

Form 1 reports the 1st of each month. **No** reports were received from Atlantic or Cape May Counties. Traffic: W2RG 159, W2BZJ 92, K2OOK 18, W2ZI 17, K2CPR 5.

WESTERN NEW YORK—SCM, Charles T. Hansen, K2HUK—SEC: W2GBX. RMs: W2RUF and W2ZRC. PAMs: W2PVI and W2LXE (v.h.f.). NYS C.W. meets on 3615 kc. at 1800, ESS on 3590 kc. at 1800, NYSTPEN on 3925 kc. at 1800, NYS C.D. on 3509.5 and 3993 kc. at 0900 Sun., TCPN 2nd call area on 3970 kc. at 1900, IPN on 3980 kc. at 1600. Congratulations to K2SIL and K2S8X on making BPL. K2S8X won first prize in the Central New York Science Fair for his talk on Satellite Radio Reception. K2DOZ has been appointed OO and OBS. K2IMK is a new ORS and K2KNV renewed as OO and ORS. W2GBX and K2VAW are sporting new KWM-1s. K2EE climbed a 75-ft. tree to put up a new skywire. Walt is 76 years young. W2VWR lost his 60-ft. tower to the wind. K2GQG is doing an excellent job as NCS of NYSTPEN. W2MTA reports plans are underway to supply communications for the AWTAR in July at Binghamton. He needs help July 6-8 for the low-frequency relay. Contact him at RD 2, Newark Valley. The SWNYVHFA is having an outing at the Great Valley Fire Tower on July 11. All are invited. Contact W2THG for details. K2ERP is offering code practice from 1900 to 1930. K2UZJ received WANE Award No. 148. The N. Chautauqua ARC held its annual banquet with the help of the Westfield ARS and the Evans ARA. W2BKC has been appointed coordinator for the ARC Mutual Aid Net. K2SAC reports that The North County ARC is going to operate from the top of Whiteface in the next V.H.F. Contest. Wow! A copy of *QLF*, the official sounding board of Lockport's A-1 operators, was received. W2QCI is the editor. W2SSC and K6VTQ (ex-W2UZS) were both at the recent Niagara Frontier DX meeting. Glad to see much deserved publicity in May *QST* on the Antique Wireless Association at Rochester. A visit to the Museum would be a worthwhile summer project for your club. Congratulations to the gang who participated in Operation Alert. All amateurs should be willing to help in an emergency. Are you doing your part? Write the SEC for further information. Traffic: (Apr.) K2SIL 702, K2S8X 459, W2EZB 287, W2RUF 197, W2TBV 142, K2GWN 117, K2UZJ 93, W2OE 63, K2IYP 60, W2RQF 37, K2YPY 37, W2ZRC 32, W2MTA 26, G2OFU 20, K2EE 19, W2FEB 16, W2CXM 11, K2DXV 11, K2HUK 5, W2PVI 5, K2WWS 5, K2DOZ 4, K2YJN 4, W2QCI 2. (Mar.) W2OE 84, W2RUT 67, K2GWN 38, W2CXM 16.

WESTERN PENNSYLVANIA—SCM, Anthony J. Mroczka, W3UHN—SEC: OMA. RMs: GEG, NUG and LXU. PAM: AER. We regret to record the death of MS, of Erie. The WPA Traffic Net meets Mon. through Fri. at 1900 EST on 3585 kc. The Penna. Fone Net meets Mon. through Fri. at 1800 EST on 3850 kc. Congratulations to Leona Schell, ZFB, on earning certificate No. 3, Worked All Penna. Counties (WAPC). Word has been received that the Etna RC will sponsor the Penna. QSO Party sometime in September. Full particulars will appear later. The Meadville Area Slow Speeders (MSS) meets every Sun. at 1830 EST on 3725 kc. with KN3GHH as net control. LSS is working on 6 meters. K3ERO is now General Class. KN3ENM has her Technician Class license. A new Novice is KN3HWT. K3GHL passed the General Class exam. BWU keeps awake nightly trying to make a schedule with KGIFN, Ice Island, on 6 meters. New calls in Bessemer are CCR and K3ICC. ZHQ made WBE and DXCC at 132/106. Up Erie way: The RAE was represented at the Hobby Show; KN3HZY has received her Novice Class license; WKD is hard at work on RACES. The AKARA is again publishing the *QRN Bulletin*. Cambria County held a communications drill during Operation Alert which was very successful. The following stations took part: W3s ZHQ, ZIO, SFJ, LSE, KUQ, BJQ, ZHU, WRE, LXQ, OKI, SHU and MIM and K3s CNP, GNP, AJB, AND and AFY. The Etna RC reports via the *Oscillator* that TOC spent an evening at the Blind Children ARC (K3AQE) explaining to the members the use of the meter reader for tuning up transmitters; PON and HSY are interested in amateur television; K3AMY is back on the air. The Steel City ARC reports via *Kilo Watt Harmonics* that KWH has a new Seneca v.h.f.; TQK has a new DX-40; TSR is now in the radio and TV service business for himself; ANX is the operator of the month. KVK now is operating on 6 meters. A brief reminder is made to all traffic men that WPA, 3RN and EAN will operate all summer on standard time. There will be no let-up on schedules. It is suggested that we all get behind these nets and help them with the traffic burden. Thanks to KUN, LXQ and LXU for the fine support they have been giving WPA and 3RN. Traffic: (Apr.) W3LXU 255, KUN 147, ZEG 109, LSS 35, KN3GHH 18, W3UHN 17, WRE 11, K3COT 5, AJB 2, W3BWU 1. (Mar.) KN3GHH 5.

(Continued on page 106)

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SPECIFICALLY for SSB

NEW E-V® 729 CARDIOID MICROPHONE

To fully obtain all the advantages of single sideband communication, it is vital that the microphone be a *cardioid type*. The ability to reject unwanted sound from the rear of the microphone is the key to better VOX reliability. Response also must be tailored for best articulation in the presence range to insure greatest intelligibility. You get all this, and more, in the new E-V 729 at only $14.70, amateur net.

The pick-up pattern of the 729 greatly increases the distance you can work from the microphone. Virtually dead for any sound pick-up from the rear, it removes annoying room reverberation, and assures smoother VOX operation. Response is peak-free in the useful communications frequencies. High output level is ample for use with all modern transmitters.

The generating element is indestructible ceramic (lead zirconium titanate) which guarantees years of efficient operation in any climate under wide variations of temperature and humidity.

The 729 in rich two-tone gray makes a handsome addition to any station. *Feels* good in the hand. Instantly lifts out of desk stand (supplied with microphone) without any hardware adjustment.

The very features that make the 729 outstanding for SSB insure superlative performance for AM, PA, and other general-purpose applications.

Model 729. Complete with desk stand, plug-in floor stand adapter and 8-ft. cable. Amateur Net, **$14.70**

Model 729S. Same with built-in on-off switch to deaden the microphone. Amateur Net, **$15.90**

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Cardioid polar pattern. Frequency response 60-8000 cps. Output level –55 db. High impedance can be used with any amplifier employing high impedance input. Two-tone gray.

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CENTRAL DIVISION

ILLINOIS—SCM, Edmond A. Metzger, W9PRN—Asst. SCM: Grace V. Ryden, 9GME. SEC: HOA. RM: PCQ. PAM: RYU. EC Cook County: HPG. Section net: ILN, 3515 Mon. through Sat. on 1900 CST. Only one month remains to secure your registration for the combined Midwest and Central Division Convention at the Hotel Chase in St. Louis. Let's have a big turnout from the Central Division. You should all have the program and publicity, so let's rush them into the convention headquarters. USR and K9JSV finally received their 9RN certificates. New officers of the Amateur Radio Emergency Association (Evanston) are K9IEB, K9HYG and K9IDA. K9HWC is now on 6 meters while K9OEJ is beaming in on 6 meters with a kw. Bert Cushway, the counsel of the CARCC (Chicago) is moving his QTH to Georgia and will be missed by his gang. K9DTB is now active on 420 Mc. and is waiting for calls and DX. The Quad City Radio Amateur Club and the Starved Rock boys reported that they had FB turnouts at their recent hamfests. K9DUA's new Challenger is bringing in the hard ones on 6 meters. K9ILS is back operating after a slight heart attack while vacationing in W4-Land. Fulton County has a new bunch of Novices. Among them are PFJ, PSB, QYM, RAH and RBN, all with KN9 calls. AOV is conducting a code class for the Canton School System's adult education program. MUL has been appointed Radio Officer of the Fulton County Area. All RACES and AREC groups participated in Operation OPAL and results were the best so far, according to c.d. officials. LQF now has 148 countries confirmed on his DXCC award. New calls heard in the Chicago Area are K9PRI, K9PPJ, K9RCR, KN9QKK and KN9RAQ. K9EGJ, K9EXP and K9ISP are the new officers of the Albany Park ARC (Chicago). PCQ reports that the ILN cleared 216 messages in 22 sessions and CSW and his North Central Phone Net totaled 676 messages during 26 sessions in April. TZN, PBI, NN, JUV, K9JBK, K9ISP, HPG, K9HCP, GFF, K9GDQ, K9CIL, WYB, VFZ, REC, LGH, K9KYF, K9BHD and IFA were high scorers in the recent Frequency Measuring Tests. CWH is now operating 2 meters on RTTY. K9JBK made his WAS award during the CD Contest. SXL reports that Bloomington soon will have its c.d. net with Communicators. K9LON's new rig is home-brew 160 meters with an 815 final. K9BTE is bringing in the hard ones on a new Drake 1-A receiver. The Rockford hams manned a 10-meter station in the c.d. van-bodied truck and mobile units helped deputy sheriffs to keep out sightseers and potential looters from the flooded area during that city's emergency when the Rock River overflowed its banks. K9DJG, RCY, JMW, KOO, KCW, CIG and LUX and W9EDA, GKI, HSY, LRZ and SUP were among those helping out. OBY and K9HKJ are putting up new beams. CWF has a new Seneca. Hamfesters will hold a QSL card design contest for the best design for a W9AA QSL card. Mail your entries to K9EED. You do not have to be an artist to win. A simple sketch will do. Traffic: (Apr.) W9IDA 652, DO 618, USR 228, PCQ 216, KN9PCS 122, W9FAW 104, MAK 101, SXL 67, TZN 54, K9JIN 43, W9CSW 41, JJN 32, K9KIL 29, IXK 26, BTE 7, W9PRN 6, K9BIV 2, ICN 2, KYP 2, LON 2. (Mar.) K9CIL 34, KIL 12.

INDIANA—SCM, Arthur G. Evans, W9TQC—Asst. SCM: Seth Lew Baker, 9NTA. SEC: SNQ. PAMs: BDG, BKJ, MEK and UXK. RMs: DGA, TT and VAY. Net skeds: IFN (a.m.) 0800 daily and 1800 M-F on 3910 kc.; ISN (s.s.b.) 1830 daily on 3920 kc.; QIN 1900 daily and RFN 0800 on Sun. at 3656 kc., all times CDST. Slow Speed QIN meets at 1700 on Mon., Wed. and Fri. on 3745 kc. Novices and others are invited to join to learn traffic procedure and freshen up on c.w. SNQ reports that a newly-appointed EC for Marion Co. is EJW who holds the AREC Net at 2000 each Tue. evening on 50.7 Mc. RTTY is becoming very popular in Hoosierland. Stations recently on the green keys: SWD, RSN, K9KKF, IXD and KKG. The Indiana Radio Club Council's Annual Hamfest will be held at Lake County Fair Grounds, Crown Point, July 19. The Indianapolis Radio Club held a home-brew night and the winner was K9EUQ, who won with a ½-watt 6-meter station built from *QST*. The Elkhart gang is all fired up on 2-meter f.m., 147.3 Mc. BKJ is home after traveling 5000 miles with daily QSOs via 15 meters to Ft. Wayne. The V.H.F. Hamfest is scheduled for July 26 at Turkey Run State Park. The Kokomo ARC will hold its Annual Big Bull Session at the Bull Pen at Highland Park Aug. 9. Elizabethtown now has five hams. Those newly licensed are KN9RLW, age 9; KN9RLV, age 14; KN9RXJ, age 11, and mother who is KN9RXK. The OM is SIO. BUQ has a Seneca on 6 meters. The RCA Club (Indianapolis) has a Gonset Communicator III being distributed among the members on a weekly loan basis. The Circle City RC (WISH TV employees) has a 2-meter f.m. station on 147.3 Mc. BDG reports IFN morning traffic as 147 and evening as 376. VAY reports

(Continued on page 108)

QIN total traffic at 371. IMO 6-Meter Net total, as reported by K9GLL, is 56. Those making BPL were NZZ, EFM and TT. This report was prepared by K9IXD at the request of IQC. Traffic: (Apr.) W9NZZ 1083, VAY 474, ZYK 422, TT 382, BDG 207, ETM 184, TQC 97, RTH 68, MEK 61, K9GBB 53, W9DGA 51, HMC 48, VNV 39, SWD 38, IMU 33, EJW 32. K9BSU 31, IXD 31, JKK 30, W9GJS 27, VPP 27, BKJ 23, PMT 21, RVM 18, STC 17, BUQ 14, HUF 13, K9AOM 11, W9ENU 11, K9GSV 10, W9BDP 9, K9PTS 8, W9DOK 7, QR 7, NTR 6, VQP 2. (Mar.) W9GUX 5.

WISCONSIN—SCM, George Woida, W9KQB—SEC: YQH. PAMs: NRP, GFL and K9IQO. RMs: SAA, K9AEQ and K9ELT. PJT is a new OPS. The BEN picnic will be held July 12 at Bayfield. Word from the committee, via BCY, indicates that they will hold a hamfest Sat. July 11. Plan to attend and spend an enjoyable week end in Northern Wisconsin at Bayfield and Ashland. The Mancorad Club held its Spring Banquet Apr. 11 at Two Rivers with 56 attending. QFC is a new DXCC member with 133 worked in 7 months with a quarter kw. K9ALP received a Naval Reserve Officer training scholarship. DYG and K9DAC are new TCC operators. Oshkosh was the site of the meeting of elected and appointed leaders of the Wisconsin section. Those present included the Central Division Director, Asst. Director, SCM, 2 PAMs, 2 RMs, 4 ECs, WTN has ceased operations until September. KN9PQT is at 47/45 for WAS. BARS, the U. of Wis. club, won 3rd prize for its display at the Engineering Exposition, competing with 18 others. A station was operated by the following: W9s LPL, ZQA, VOO, SZR, UDK, GSS, W5s YSC, ZLA, W4VRD, K9s AYU, DIE, DIM, BTQ, IER and CJL. New officers of the Northwoods Club of Rhinelander include AMN, pres.; YZS, vice-pres.; K9JJR, secy. UEB had the excellent average of 17.7 parts per million error with 3 frequency measurements. K9s GYQ and DAC received 9RN certificates. The project of reviving the Wisconsin Council of Radio Clubs is open to any club. Contact the SCM for particulars. RQM and FZC, of Wausau, and a group from the MRAC paid the Madison Club a visit. Red Murrell, formerly of Menasha, now KH6CVH on Oahu, is looking for Wisconsin contacts. K9CJK announces results in the MRAC-Wis. '58 QSO Party. Certificates went to the following: C.w.—DYG 1411, KQB 1368, RKP 1332; phone—K9ALP 6336, K9CAN 5280, FMI 3968; phone and c.w. RQM 8446, K9ELT 3360, PJT 1890. Traffic: K9DAC 524, W9DYG 470, K9GYQ 253, W9SAA 98, KQB 75, K9DTK 63, IQO 59, W9YT 54, CBE 27, CCO 26, K9ALP 21, W9SIZ 19, K9GSC 16, PDJ 15, W9WJH 14, K9ELT 13, LMX 10, W9GIL 5, RQM 5, K9GDF 2, W9RKP 2.

DAKOTA DIVISION

NORTH DAKOTA—SCM, Harold A. Wengel, WØHVA—SEC: KØJLW. KØCNC is working on a 2-meter transmitter and beam. He also reports that he is moving his shack downstairs. KØAZX has a new Heathkit Cheyenne transmitter. KØJLW and ESO are sporting new Regency converters. JLW is back on the air, mobile. KØIQJ has been appointed RACES Radio Officer for North Dakota. The Teddy Roosevelt Amateur Radio Club is sponsoring a hamfest and convention at Teddy Roosevelt National Park, Medora. The dates are Sat. and Sun., July 11 and 12. Registration blanks have been sent to amateurs in North Dakota and surrounding areas. Traffic: KØKJR 37, CNC 26, WØCAQ 12, HVA 12, KØGRM 11, WØDNJ 8, KØMHB 7, MPH 6, GGI 4, ITP 4, MBG 3, PLY 3, WØBHF 2, KØKBV 2, MHD 2, QKP 2.

SOUTH DAKOTA—SCM, Les Price, WØFLP—Asst. SCM: Gerald F. Lee, ØYKY. SCM assistants, FKE and NEO. SECs: YOB and GDE. PAM: SCT. RM: KØBMQ. The C.W. Net reports QNI 61, high 6, low 3, average 4.7; QTC 7, high 2, low 0, average 5; informals 13, high 3, low 0, average 1. The So. Dak. 40-Meter Phone Net, which meets Mon-Sat. at 12:15 P.M. CST on 7225 kc., had 22 sessions, KØLXF 18, SCT 4; QNI 402, high 31, low 8, average 18.27; formal traffic 104, high 13, low 0, average 4.727; informals 49, high 5, low 1, average 2.227. The So. Dak. 75-Meter Phone Net, which meets daily at 6:30 P.M. CST, Sun. 9:30 A.M. on 3870 kc., had 34 sessions, KØBQR 4, CTZ 2, KØDUR 6, KØBMQ 5, SCT 17; QNI 848, high 38, low 9, average 25; formals 78, high 8, low 0, average 2.03; informals 91, high 6, low 0, average 2.676. The So. Dak. WX Net is closed for the summer. In the April 17th c.d. drill 32 stations from 19 towns handled 16 known messages. On the 18th, 20 stations from 15 towns handled 8 remaining messages. KØIAW made a second trip to the Watertown hospital. CTZ has a new Dupree ham for a neighbor 3 blocks away. KØPDW has a Heathkit DX-35 and an S-75 receiver. OQQ is back in Rapid City and will be on 3870 kc. KØOMP sold his DX-100. Our sympathy to SCT, whose brother passed away suddenly Apr. 18. YVF had part of this thyroid gland removed in Minneapolis in April. Lyle has a Mosley Tribander for 10, 15 and 20 meters in the basement, and hopes to get it up on a 40-ft. tower soon. HFE and family have moved from Yankton, to Waukesha, Wis. KØDZG has returned home after spending some weeks in the Veterans Hospital in Sioux Falls. Traffic: WØSCT 426, DVB 103, ZWL 100, KØBMQ 99, WØFJZ 99, KØAIE 26, WØCTZ 24, KØBYV 21, KLR 20, LKH 12, DUR 11, MTZ 9, RKJ 9, BQR 4, LXH 4, CWJ 3, INZ 3, WOFP 3, DIY 2, FLP 2, KØOLN 2, PQW 2, APZ 1.

MINNESOTA—SCM, Mrs. Lydia S. Johnson, WØKJZ—Asst. SCM, Rollin O. Hall, ØLST. SEC: TUS. RM: KØGCN. PAMs: QVR, TUS, TCK. A most hearty "thank you" to all who participated in the Conelrad Alert. WAM certificates were issued to KØKVA, KCY and KOJ. Minnesota QSO Party winners: phone only, KØHJC; c.w., KJZ; phone and c.w., KØIDV. New officers of the SPRC are EXC, pres.; KØDYT, vice-pres.; KØQGN, treas.; KØIKR, secy. KØMEQ has an antenna set-up so that he is able to work 10 through 80 meters. Congratulations go to WMA, LST, WKO, FNA and RA for high average accuracy in the Frequency Measuring Test. KØIDV received Class II OO appointment. LIG resigned as EC of Lake County. RQJ renewed his ORS appointment. OPX and WMA renewed their OPS appointments. KMG net members were kept busy because of raging forest fires in the north. KLG completed wiring his Apache transmitter. KØEWC was admitted to the U. of M. Hospital for further surgery. KØEOW, Jeanne, who is an M.D. in Fergus Falls, is on the air with an HT-32 and an HT-33A and receives with a 75A-4. EC LUP rebuilt his two-element beam and put up a 75-meter antenna. KNØQVF and QQS took their Conditional Class exams. New officers of the Lake Region Amateur Radio Club are LUP, pres.; KNØQQS, vice-pres.; KNØSDM, treas.; KØEOW, secy.; AUU, act. mgr. Our deepest sympathy goes to the families of IZS and MUL, who joined Silent Keys. TVG, SYG, and URQ are building and flying radio-controlled model airplanes. OMC's jr. operator is waiting for his Novice call. DZJ, MARS operator, is now using a BC-221 frequency meter and a TBX transceiver. KØBLU has a new GSB-100 and is building a 701A final. KØDEH was blessed with a new baby, also a Ranger transmitter. KØCNE has made California his home. ZZY can be heard on 6-meter mobile. AHV has a new self-designed, home-built 450-watt s.s.b. rig. FGV has a new addition to the family but finds time to conduct code classes in Pine City. Out-of-State Minnesota QSO Party winners are K7AUS, K3AHT, KØLCI, K8JLF, W8BIX, K9ALP, WØRJF, K2EIL and VE2IL. Traffic: WØKJZ 200, KØIDV 98, WØOPX 63, KØKYK 60, ORK 54, WØHEN 46, KLG 39, OJK 38, KØGCN 36, WØLST 36, UMX 36, TUS 28, BUO 25, RIQ 25, WMA 24, KØMAH 23, WØDQL 22, KØMNY 22, WØTCK 21, KØEPT 20, WØVBD 18, KØHJC 17, WØOJG 17, ALW 16, QVR 16, FGP 14, KØMGT 13, JJE 12, WØOET 12, KØOBP 10, WØQVQ 9, KNØQBI 8, WØRA 4.

DELTA DIVISION

ARKANSAS—SCM, Ulmon M. Goings, W5ZZY—SEC: K5CIR. PAM: DYL. RM: K5TYW. ØJOY is back with us in Arkansas and is stationed at Jonesboro. K5HSJ says he had the time of his life in the CD Contest. IXC is back on the air after several years absence. Goob, we are glad to see you back. Several of the boys from the Jonesboro Club met with the MCARA in Blytheville this month. They were very welcome guests. AUU says he had found a gadget that will take all the crud off s.s.b. KRO has that big rig of his on the air again. It is reported that QHY is getting his feet wet in RTTY. A new ham in Blytheville is KN5USD, brother of your SCM. DUV is operating s.s.b. on 6 meters these days. We are very happy to have met so many of the boys at the Eureka Hamfest. Traffic: W5BYJ 91, K5HSJ 58, TYW 49, IPS 43, W5ZZY 14, W4OGY/5 8, K5UBV 1.

LOUISIANA—SCM, Thomas J. Morgavi, W5FMO—The Lake Charles Fishfry was held at the Fourth Ward Park between Lake Charles and Sulphur May 2-3. Among those attending were Delta Division Director BSR, SCM FMO and PAM CEW. Approximately 150 hams attended. CCD acted as major-domo. CEZ just missed BPL because of too many out-of-town trips. There are now four new Novices at Carville. EA is fixing to build himself a new QTH. K5QMY is active on 75 meters. MXQ reports that conditions in the evenings are poor and getting worse and the need for c.w. nets is greater than ever. How about you c.w. men reporting into RN5 and CAN and helping out with the traffic that is being handled? RN5 meets nightly 7:45 P.M.-9:30 P.M. on 3645 kc.; CAN at 8:30 P.M. on 3670 kc. KRX is getting back in the traffic nets after a little lull the

(Continued on page 110)

THE ANSWER TO DX . . .
GONSET SSB EQUIPMENT

Any owner of the Gonset GSB-100 SSB transmitter/exciter and the powerful 1000 watt P.E.P. linear will have the pleasure of answering plenty of DX cards . . . and calls! This is SSB equipment of advanced design—stable, dependable—entirely non-critical, puts every desirable operating convenience at your fingertips.

Consider the GSB-100 transmitter/exciter:

● An exclusive filter-phasing system for improved SSB quality ● Unwanted sideband suppression of 45 db ● Quartz crystal carrier elimination filter avoids need for critical carrier balancing ● SSB with selectable sidebands, AM, PM, CW. ● Excellent CW keying characteristics ● Flexible pi network output and quick band change on 80-40-20-15-10 meters ● Built-in heavy-duty AC power supply ● VOX, voice operated control circuit complete with anti-trip circuit. Biasing voltage available for linear amplifier cutoff when receiving ● Frequency control by fixed quartz crystals and exceptionally stable VFO ● Transmits both sidebands when on AM, avoids distortion present at high modulation percentage when carrier-and-one-sideband signals are received on conventional AM receivers

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past few months. K5IQZ has been appointed Asst. EC for the Sulphur Area by EC SKW. Rog now has six assistants. Plans are now being made to install a complete station at the Boy Scout Camp at Edgewood, La., and to handle traffic a couple of times a week for the boys up there. In July a BC-669 will be installed at the Weather Bureau for the hurricane season. SQB, who has been doing a bang-up job as EC for the Lafayette Area, had to resign because of the pressure of business and recommended K5OPH in his place. K5OPH has a communications trailer just about ready to go, which will include a 75-meter rig, a.c. generator, first-aid and camping equipment. Traffic: (Apr.) W5CEZ 416, MXQ 120, K5QMY 43, DMA 9, W5EA 3. (Mar.) W2KRX 218. (Feb.) W5KRX 192..

MISSISSIPPI—SCM, John Adrian Houston, sr., W5EHH—EMM reports the Meridian Club is very active. At a recent meeting CUU discussed safety precautions on fixed and mobile stations. The club had a caravan of mobiles to and from the Birmingham Hamfest. New officers are K5KPV, pres.; UTL, vice-pres.; and K5KVM, secy.-treas. The Emergency Drill Net is held each Sun. at 2 P.M. on 3808 kc. W5DEJ's XYL had a serious operation. K5BGG is back home in Greenville after several weeks of special training in Alabama. ZZV has been off the air rebuilding his exciter. IGW is MM on the Missouri River. He can be heard on 40-meter phone around noon. IGW was in Council Bluffs, Ia., recently and had ØGG and his wife aboard for a trip down the Missouri River K5QNF is doing a fine job with the Mississippi C.W. Net each evening on 3775 kc. K5RFW finally got his rig to load on 7460 kc. The MMEN held 24 sessions in April and handled 34 formal messages. NCSs for April were K5IHQ, JMD, CFG and NRU. The net manager is K5IHQ. Traffic: K5QNF 148, SQS 65, AUR 30, QNE 21, HAR 10, MFY 5.

TENNESSEE—SCM, R. W. Ingraham, W4UIO—The Oak Ridge Club won a blue ribbon in a hobby show and will sponsor the Crossville Picnic on July 18 and 19. Chattanooga announces the Choo-Choo Hamfest for Aug. 1 and 2. K4PZJ reports from Memphis that there are 65 active on 6 meters and that they participated in a Cancer Airlift. GJY, ex-71HG, is active on 75-40-meter RTTY from Bristol. Official Observers' reports: K4KYO graduated from school in May, K4ILU reports all stations had good audio, also K4SGF and TDZ. The Johnson City Club has one unit operating from a trailer with the call ABR. WBK says YMG and K4BOM operated K4BOM/4/5 on an island at the Tenn.-Miss. line on 20-meter c.w. K4TRY reports that he and K4VIU have new NC-188s; YNK and K4VDQ new Apaches; K4GMQ a new 75-meter mobile; and K4KLX a new jr. operator. WGJ is leaving for Army service. F7CV/W4ZJY reports that K4BEO is returning to Knoxville and will be on 3980-kc. s.s.b. K4OUK has a new Apache. TDZ recommends that all phone OBSs use a tape recorder. TZG asks all to listen for 2-meter signals from LaFollette. YRM was NCS for the Nashville-Davidson Co. C.D. Net Traffic: (Apr.) W5RCF 722, K4JNK 217, CNY 212, W4SKH 180, VJ 69, JVM 53, CXY 51, YRM 45, TZG 40, UIO 33, PQP 28, IGW 22, PAH 19, PFP 18, TDZ 18, RRV 17, UVL 13, K4OUK 4, W4ZBQ 4. (Mar.) K4PUZ 42, TRY 8, W4WGJ 8, YRM 4.

GREAT LAKES DIVISION

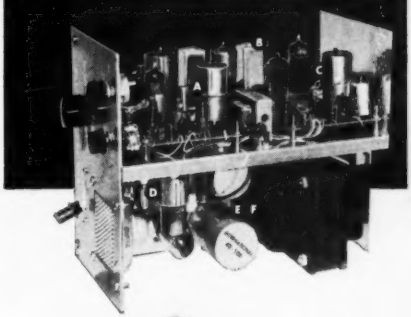
KENTUCKY—SCM, Robert A. Thomason, W4SUD—Asst. SCM: W. C. Alcock, 4CDA. SEC: BAZ. RMs: K4AIS and LHQ. PAMs: W4GTC and K4MMW. S.S.B. PAM: MMY. V.H.F. PAM: K4LOA. LOA reports a 6-meter net is planned for the fall with prospects good. Your v.h.f. gear should be put in top condition. Hanks would like to hear your plans. During Operation Alert we again were able to demonstrate our emergency communication preparedness to public officials. We also were reminded of our weaknesses on which we can work toward improvement. I hope everyone enjoyed the June QSO Party. Suggestions for new rules are invited for the next party, scheduled for Oct. 3. Mary, K4VDO, is a new member of KYN. PPK, RSU and FWH are new KPN members. OGY still is active on KPN from Arkansas. PXX originated 127 messages from the Paducah Scout-A-Rama. K4ZML reports he is active in six nets daily. Bill is a big help in moving traffic between nets. SBL has a new 10-meter beam. HTD has his Extra Class license. ELG has new gear on 6 and 2 meters. KN7GIQ has a 2-meter Gonset mobile. K4SPJ reports he is going to stay on v.h.f. OO reports were received from K4GAG, K4BUB and SZL. Traffic: K4VDL 742, CSH 302, W4PXX 165, K4AIS 153, OAH 135, ZML 110, IFB 87, W4GTC 75, SUD 60, K4VTY 50, MMW 49, W4ZDB 38, K4LHQ 37, W4HWO 33, K4QYP 32, PNA 30, W4CDA 29, K4SBL 28, PPK 26, W4KJP 24, K4KIS 18, W4HTD 17, K4QCN 16, W4SZB 15, YYI 13, K4MPV 12, QHZ 12, KN4YCB 11, K4SBZ 11, TYP 8, W4ELG 6, K4LOA 6, KN7GIQ 5, K4JOP 4, W4WVU 2, JHC 1, LUB 1, MMY 1, SZL 1, VJV 1.

MICHIGAN—SCM, Thomas G. Mitchell, W8RAE—SEC: 8YAN. RMs: FWQ, OCC and QQO. Your new SCM is Ralph P. Thetreau, FX. See page 6 of this issue for his address. The mail was very light this month except for the few following remarks and traffic reports. Congratulations to the GRARA on the fine convention in Grand Rapids. MM has been appointed EC for Montcalm County The following stations participated in the Feb. F.M.T.: APL, AYY, BWS, CLR, DD, HPR, RZZ, TSQ, VDD, K8CWI and HFO. This is the best F.M.T. participation from Michigan that I can recall. Congrats to all. CAM was selected to receive the Cosmo Calkins Award sponsored by the CMARC (Lansing). The recipient and other nominees are to be congratulated on their contributions to amateur radio in Michigan. We are also grateful to the CMARC for its sponsorship of the award. Traffic: W8OCC 185, JKX 104, QQO 104, FX 98, K8KVV 95, W8FWQ 86, DSE 75, NOH 56, YAN 55, TBP 42, K8GJD 32, AEM 25, W8AHV 18, MHZ 16, PXA 16, ILP 14, WXO 13, ALG 11, K8ABW 10, NAW 9, W8SCW 9, HKT 7, AUD 4, EGI 4, TIC 3, QIX 2, SJF 2.

OHIO—SCM, Wilson E. Weckel, W8AL—Asst. SCM: J. C. Erickson, 8DAE. SEC: UPB. RMs: DAE and VTP. PAMs: HZJ and WYS. New appointments: ZYU and K8KHS as ORS; K8s HUF, GWK and JIX as OOs; K8III as OES; TSE and UPA as ECs. BN joined Silent Keys. K8BXT received the W-Conn C.W. Award. The Ohio Council of ARC's 1959 officers are ILC chairman; GDQ, vice-chairman; THX, secy.; and AL, treas. Cuyahoga County AREC's mobiles picked up the Cancer Fund collection with AUE, BAH, BHR, KGX, LHX, NZI, OHA, SUI, TFR, UQS, VFU, ZEP, K8s AAG, ABA, BWH, CDA, CFH, GJW, GV,K HCS, HVH, IZL, JHZ, JIC, KKO, KNJ, LMV, MBV and MBW participating. HFK, the son of EEQ, is on 6 meters. WGB and WRH have a new Knight receiver and a ten-element Taco beam. The stork brought a baby son to LOD and girls to GPL and JZL. The Mayor of Fostoria gave a travelogue with film slides on Alaska to the Seneca RC. The Ohio QSO Party was very disappointing because of lack of stations participating, especially on 40 meters. There was no activity on 6 meters. This is one way to get the counties you need for this hard-to-get certificate. Those who have it in order received are EQN, HUX, AJW, CTZ, VZ, HZJ, IBX, 9ECE, JHH and AL. K8HVT received a WAS certificate. 4FES/8 has a new Sky Sweep receiver. TTU has a new Seneca. K8OGN has a new Challenger. GKB has a new HT-32A and announces the forming of the Spirit of Ninety-Six Net, which operates daily at 2100 on 7296 kc. The Indian Hills RC held its annual club dinner with musical entertainment, a film shown and many prizes given. This club meets the 1st and 3rd Thurs. at Lynhurst YMCA. K8AXG has his General Class ticket. K8EMC joined Silent Keys. Toledo's *Shack Gossip* "Ham of the Month" is TCH, IAA is now K7HHA. ESN spent a vacation in Florida, the Toledo RC's 1959 officers are CFN, pres.; MQQ, vice-pres.; K8IDO, rec. secy.; K8DOF corr. secy.; and DN, treas. The stork brought KPJ a baby boy. The Greater Cincinnati ARA's *The Mike and Key* tells us to mark our calendar with a circle around the date of Sept. 27, for on that date the GCARA will hold its big hamfest at Stricker's Grove in the Mt. Healthy Area. At the last meeting it was "Old Timers" night when ALW, ex-8ARS, ATK, AXY, BFB, BOJ, CNV, CQM, DL, ex-EFS, EL, ESG, HBM, JBL, MGP, NCV, NDN, OID, QMP, SMQ, UPB, UPC, 4KZF, 4PHZ and K8CJS registered and had a wonderful time swapping tall stories. The amateurs of Ohio will have a chance to attend both the Cincinnati and Findlay Hamfests this year. That is, if Findlay selects its usual first Sun. in September for its hamfest. Thanks, GCARA. 4KVX showed color slides of the DXpedition to Serrana Banks using KC4BB as the call. KN8OMD is a new ham in Hamilton. QJO worked 6 meters from the hospital where he was a patient. UNW also is on 6 meters. K8HGT has a new Mohawk. MPW put up a new tower. Coshocton County AREC's 6-meter mobiles picked up the Cancer Funds with CUT, RYW, K8s BEN, BZO, CLC, KN8s N8G and NYN taking part. DAE and UPH made BPL in April. K8NIB has a new 220-Mc. Filter King converter. TTJ, K8s BNR, EML and HED have gone s.s.b., BNR with a 20A and EML and HED with a 10A. TZO is running 100 watts on TV on 432 Mc. K8IKB has an S85/QFI and a DX-40 to a three-element Tri-bander. SQK won an HT-32A as 3rd prize in the Hallicrafters V.H.F. S.S.B. Contest, then he bought an HT-33A to go with it. Traffic: W8UPH 1159, DAE 306, ZYU 199, AL 177, QLJ 109, YGR 83, VDA 77, K8JIX 75, HVT 54, W8GQD 50, K8CTQ 47, W8BZX 44, GKB 42, BEW 26, K8DHJ 24, W8HGT 23, SYD 22, QIE 19, K8DDG 17, W8EAJ 16, K8KSB 16, W8STR 14, K8DTZ 13, W8LT 12, K8HDO 10, W8RO 9, K8HUY 8, W8LMB 8, K8JZZ 7, W8HPP/8 7 K8HEJ 4, W8WYS 4, K8EBO 3, W8HZJ 2, K8IMN 2, W8LGR 2, QCU 2, WRH 2.

(Continued on page 112)

International SUB-ASSEMBLIES



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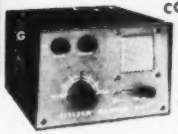
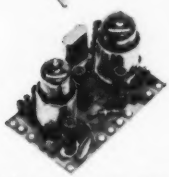
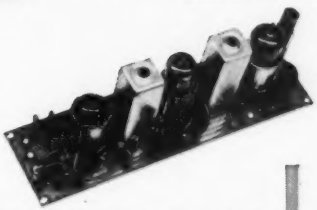


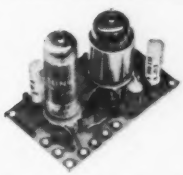


A RF Converter Unit (Printed circuit prewired) Two-tube crystal controlled converter. Converts Ham* frequencies to range of tunable IF. Can be used with IF unit (B) or any communication receiver. 6BA6 RF and 12AT7 mixer-oscillator. Shipping weight 2 lbs. $14.00.

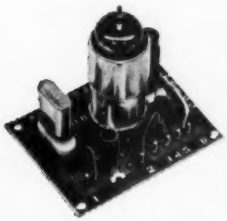
*20 meters, 10 meters, 6 meters.



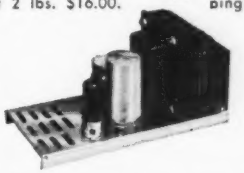
B IF Unit (Printed circuit prewired) Consists of mixer and tunable local oscillator feeding 262 KC IF stage. Includes noise-limiter and squelch circuits. 6AN8 mixer-oscillator, 6BA6 IF amplifier, diode detector, 6AL5 noise-limiter/squelch. Designed to work with units A and C. Makes dual conversion receiver. Shipping weight 2 lbs. $16.00.



C Audio Unit (Printed circuit prewired) Consists of speech amplifier for crystal microphone, first audio for receiver and power amplifier/modulator stage. Designed to follow unit B. 6AN8 speech amplifier/audio, 6AQ5 power amplifier modulator. Includes output transformer but not speaker. Shipping weight 2 lbs. $13.50.



D Transmitter Unit (Printed circuit prewired) Oscillator and amplifier. Crystal controlled. Requires Unit C for modulation. 6AU8 tube. Shipping weight 2 lbs. Complete with crystal and tube. $14.50.



E Power Supply 115 VAC only (not prewired). Consists of all parts necessary to construct a power supply to operate Units A, B, C and D. Shipping weight 10 lbs. $12.00.

F Power Supply 3-way 6 VDC, 12 VDC or 115 VAC (not prewired). Same as E but will operate from any of three different power sources. Shipping weight 10 lbs. $20.00.

G Cabinet (all metal) Includes all necessary hardware, switches, speakers, panel, case, etc., to combine Units A, B, C, D and E or F into a complete receiver-transmitter assembly. Complete with instructions. Shipping weight 10 lbs. $20.00.

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HUDSON DIVISION

EASTERN NEW YORK—SCM, George W. Tracy, W2EFU—SEC: W2KGC. RM: W2PHX. PAMs: W2IJG and W2NOC. Section nets: NYS on 3615 kc. at 1900, NYSPTEN on 3925 kc. at 1800, IPN on 3980 kc. at 1530, ESS on 3590 kc. at 1800, ENY (emerg.) on 29.490 (Thurs.) and 144.35 Mc. (Fri.) at 2100, MHT (Novice) on 3716 kc. Sat. at 1300. Endorsement: K2CXO as EC. Nice to hear W2FAR, W2HBC and W2SUC had radio vacations in Miami and Jamaica. New officers of the Rip Van Winkle Club in Catskill include W2OXX, pres.; K2CRB, vice-pres.; K2YJL, secy.-treas. The Lakeland Slow Speed (LSS) Net, on 3701 kc. at 1700, reports 10 sessions in April, averaging 12 stations. Speaker at the Schenectady Club was W2FBS on antenna impedance matching. K2CRZ was home on furlough and will return to Africa for duty. Officers of the Yonkers ARC include K2MQR, pres.; K2HGN, secy.; K2BFU, treas.; K2BIG, editor; W2LWK, tech. advisor. A CP 20-w.p.m. certificate was received by K2BIG. K2EIU has taken a surveying job in Greenland until October. The 1959 officers of the Albany Club include W2GM, pres.; W2APF, vice-pres.; W2AAO, treas.; K2LET, secy.-editor. State Radio Officer W2BGO reports that RACES Command Nets (3509.5 and 3993 kc.) performed well in spite of poor conditions during Operation Alert Apr. 17-18. Traffic: (Apr.) K2UTV 1082, K2YZI 427, W2PHX 176, K2MBU 142, K2UYK 124, K2BIG 104, K2RKY 95, W2ATA 86, W2EFU 46, K2GKK/2 34, WV2AKK 28, K2LKI 19, W2MTS 15, WV2BWE 10, K2CKG 7, K2EIU 6, K2YJL 1. (Mar.) W2FVP 36, W2SZ 17, WV2BEW 9, K2EIU 4.

NEW YORK CITY AND LONG ISLAND—SCM, Harry J. Dannals, W2TUK—SEC: W2ADO. RM: W2VDT. PAM: W2UGF. V.H.F. PAM: K2EQH. Section nets: NLI, 3650 kc. nightly at 1930 EDT and Sat. and Sun. at 1915 EDT. NYC-LIPN, 3908 kc. Mon. through Sat. from 1730 to 1830 EDT. NYC-LI AREC, 3908 kc. Sun. at 1730 EDT, V.H.F. Traffic Net, 145.8 Mc. Tue. through Sun. at 2000 EDT. BPL cards are awarded to W2KEB, K2QBW, K2GQO and K2MIG, the latter two on originations plus deliveries. The V.H.F. Net reported a total of 350 messages handled, largely as a result of the operation of K2GKT/2 at the Boy Scout Exposition at the N.Y.C. Coliseum. Stations participating in the three-day event were W2EW, W2KEB, W2ZRA, K2KVL, K2LVR, K2QVE, K2UCY, KN2UYV and WV2EGC. K2IRS is now using a Viking II and a rotatable Wonder Bar antenna. K2YMU is building for s.s.b. K2RBS installed a Transcon rig for 6-meter mobile. K2MEM added grid-block keying to his DX-100. K2VDR received a certificate from the Air Force for his ARRL-IGY monitor work. Bruce worked Ecuador on 50 Mc. and ditto his dad, W2SCA. K2OEG finally snagged North Dakota to complete his WAS. K2IWZ moved across the Hudson to Elizabeth, N. J. K2UYG nears DXCC with 98 countries worked. Bill received WAS, WBE, DUF/2, WASM and A-1 certificates to round out a busy month. New officers of the Columbia URC are K2UDN, pres.; K2ABA, vice-pres.; WV2BIY, secy.; W2SLC, treas.; W7YAQ, comm. mgr.; and K2RCG, tech. dir. W2IEY has a new KWM-1. K2QDD has a new HQ-110. K2TBU received his WAC, DUF and WANE awards. K2HTX, EC for Huntington, urges all hams in that Township to join AREC/RACES. K2RDA snagged country No. 100 with his Apache and NC-300. The club station at K2YRM is using a G4ZU tri-band beam. Officers of the newly-formed Bayside ARC are W2LOJ, pres.; K2JWD, vice-pres.; K2HGR, secy.; K2UVV, treas.; and K2JLD, club NCS on 28.8 Mc. K2KSP, representing the Nassau 2-meter mobile net on 145.68 Mc., asks interested parties to join the group Mon. at 2100 EDT. It is with deep regret that I report the membership of W2ATT in Silent Keys. K2SEW passed his General Class exam. Ex-W2HAP now signs WA6ESU. K2TSW is stationed in San Antonio with the Air Force. K2SCF is on 6 meters with a TBS-50D and an Ameco converter. K2GCE made WAC. W2SEU is on 50 and 220 Mc. On the latter band he has a 22-element array with 20 watts and worked 4 states in a month and a half. A KWS-1 is a new addition at W2AEV. WV2EXN joined OM W2NBH on the air. K2YOZ moved to Port Washington. K2RKL built a 30-watt final for 432 Mc. A slight lull in 432-Mc. activity spurred W2AOD to build gear for 220 Mc. W2MTD, trustee for the Brooklyn Red Cross station, K2QDB, reports the RCB Net active Sun. mornings on 29.4 Mc. at 1000 EDT. New officers of the Eastern Suffolk RC are Bob Groome, pres.; K2EC, vice-pres.; WA2CFF, secy.-treas. K2DTJ and K2YGL passed the General Class exams. K2MGA has a new NC-300 and a Filter King converter on 6 meters. Traffic: (April) W2KEB 3570, K2QEW 557, W2EW 299, K2UBG 284, W2VDT 234, K2VCO 199, K2GQO 153, K2MIG 150, W2DRD 119, K2KYS 108, K2HVY 88, K2IRS 73. K2YMU 67, W2UGF 43, K2BH 36, W2GP 31, K2PHF 31, WV2BST 28, K2MYS 28, W2UAL 28, W2JBQ 19, W2EC 17, K2IFZ 17, W2DUS 16, WV2EGC 14, W2BO 13, K2RBS 11, K2MEM 10, W2IVN 9, K2RHG 9, WV2EBD 7, W2MDM 6, K2QZS 6, W2PF 5, K2GKT 4, W2GQN 4, K2LFR 4, KN2THI 4, K2VIX 4, K2AZT 2, K2BVN 2, WV2CCF 2, K2VDR 2, K2OKX 1. (Mar.) K2QBW 396, K2UBG 189, K2KXT 88, W2GP 70, W2AEE 50, W2IEY 47, K2BH 30, K2MYS 28, W2OME 27, W2DUS 26, K2IFZ 25, K2RDP 24, K2YMU 19, K2SFS 16, WV2BST 13, K2QZS 12, K2GKT 11, W2EC 10, K2RKL 10, WV2DJT/2 7, K2RHG 6, K2QDD 5, K2AAW 4, W2PF 3, K2QQH 2, K2TBU 2, K2UYG 2.

NORTHERN NEW JERSEY—SCM, Edward Hart, jr., W2ZVW—SEC: W2IIN. PAMs: K2KVR and K2VAC. RMs: W2ADE and W2RXL. NJN (c.w.) meets daily at 1900 on 3695 kc., W2RXL (RM) is manager. During April the NJN held 30 sessions with an attendance of 610; 404 messages were handled. The NJ6 (phone) meets at 2300 on 51.15 Mc. The New Jersey Phone Net meets at 1800 on 3900 kc. daily except Sun. and Sun. at 0900. The NJSS (slow-speed c.w.) meets at 1800 on 3748 kc. April totals for the net: 21 sessions, attendance 94, traffic 134. K2IZN checks in with his first BPL. K2UCY was active with traffic from the coliseum during the Boy Scout Jamboree. W2RON, K2AHT and K2EMZ were released from school for the c.d. drill. WV2AYI checks in for his second BPL. W2NIY received a WRV (Swedish) certificate. K2ZMO shortly will start to have operating problems. His dad just passed the Novice test. K2AGJ continues her fine work of teaching newcomers. K2KVR acted as auctioneer for the Raritan Bay Club. WA2CCF was active 20 hours in OPAL. K2GIF reports the bands sure were dead during the Conelrad Test. K2UKQ was in the CD Party, worked all Goose Bay, had WABE confirmed, received DXCC, and almost ran off the card making her report. W2CVW now has a hat for RACES with a badge marked "radio operator." K2VAB, a long time c.w. man, is building a modulator. W2PTS got an RCC certificate. W2TSQ is putting up a phone pole. K2VVL, a new ORS, makes BPL. K2MFF challenges W2DRV for the July CD Party. W2GVU will be at Galveston for the convention. W2REH is working on a break-in system. This is a must for traffic stations. K2MIV is now General Class. K2OQA is active with a new Viking. On April 25, five children were lost in the mountains of Sussex County. W7IJG/2, K2YMO, K2VOT, K2AGV and K2CBK all helped in the search. K2RMD is working on TVI. K2IZV is in the MARS Net and NJ6. A call for blood donors on NJPN by K2MFX was answered by 37 amateurs. W2MRV won first prize in the *Boys' Life* Short Wave Contest. Traffic: (Apr.) K2UCY 258, K2ZHK 227, K2IZN 177, W2RXL 165, K2VVL 143, W2ZVW 134, K2GIF 126, W2CQB 115, WV2AYI 109, W2OPB 97, W2RZO 93, K2AGJ 88, K2VAB 85, W2EBG 73, K2YJH 64, K2VNL 62, K2YBC 46, K2VNK 34, W2REH 32, W2BRC 26, W2DRV 26, W2CVW 24, W2RON 19, W2EWZ 18, K2MFF 18, WA2CCF 17, K2VLU 15, K2ZMO 15, K2QYI 13, K2KVR 12, K2KFR 11, K2MFX 11, K2LWQ 10, K2JTU 8, WV2BLJ 5, W2TSQ 5, W2CJX 4, W2PTS 4, W2NIY 3, K2UKQ 2. (Mar.) K2VNL 43, K2VNK 15, K2KVR 11.

MIDWEST DIVISION

IOWA—SCM, Russell B. Marquis, WØBDR—New officers of the Iowa 75-Meter Phone Net are NGS, Net Control; LGG, 1st alternate; KØAPL, 2nd; MEL, 3rd; and JDV, 4th. Board of Directors: 1st district, TTT; 2nd, NTB; 3rd, JPJ; 4th, KØDVO; 5th, VWF, also Board chairman; and 6th, KØBRE. New appointments: NGS as PAM, KØQAI as OO, DPT as OPS, IZI and IWC as ECs. Renewals: YDV as OPS, KØBXO as EC and FMZ as ORS. QVA is using a new 10 through 40 Hi-Gain vertical. The Sioux City Central Club reports 11 new Novices and 4 Generals this spring. Its station, LNI, has a new heavy-duty rotor and a Valiant. GQ is now using the Collins 75S and 32S gear. SQE is back in Iowa at Cedar Rapids and is active on 20, 15 and 10 meters but expects to get on 80 and 40 meters soon. QVZ has worked 163 countries on two-way s.s.b. LGG reports that KØLUZ is the latest TLCN member. KNØQKI and RGM demonstrated their equipment at an Adult Hobby Show in Ames. They were assisted by 3 mobiles and several fixed stations. WLR, YXD, and KØDLK were appointed to the Board of Directors of the Cedar Valley Club to replace three who resigned. Traffic: WØBDR 1512, LGG 1216, LCX 714, KØCLS 302, CYF 106, WØNGS 85, GXQ 82, BLH 69, KØAGJ 52, WØOFW 45, SLC 42, NTB 32, VQX 30, KØMMZ 28, WØQVA 27, BTX 24, KØAPL 19, GXP 19, BLJ 18, KAQ 13, WØJPJ 12, NYX 12, YDV 9, VWF 8, EEG 7, MEL 7, RQA 7, UTD 7, ADB 6, GQ 6, KØLHH 6, JGM 5, WØPTL 5, KØRTJ 4, KBX 3, WØFDM 2, KØLBF 2, POB 2, QAI 2, WØQVZ 2, KØAPS 1.

KANSAS—SCM, Raymond E. Baker, WØFNS—SEC: IFR. Asst. SEC: LOW. RM: QGG. V.H.F. PAM: HAJ. LEW has resigned as PAM. Thank you, Bob, for two years of hard and faithful work. Appointments: DEL and WYK as Class I OOs. Renewals: OAQ and SAF as

(Continued on page 114)

New Citizens Broadcaster CB-100

11 M TRANSCEIVER FOR USE BY ANYONE NO EXAMINATION

Just fill out FCC Form 505

Complete with Xtals. for One Channel & Mike

$129.95

For home, office, car, boat, field, etc. 115VAC or 12V mobile. Exclusive 3-channel selection switch and button light indicators. Squelch control for muting background noise. 10-tube receiver/transmitter, xtal. controlled. AM modulated. Meets all FCC specs. Compact: 3½x13x10½"; 9 lbs. Carry handle for tilt stand or permanent mounting.

New Globe Champion 350

350w CW, 275w AM

450w (PEP) SSB — DSB (Suppressed Carrier)

W/T: $409

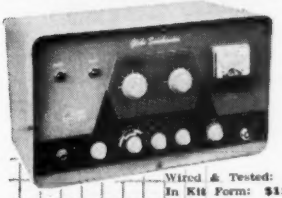
- ★ All modern design new cabinet
- ★ New filtered keying circuit virtually eliminates key clicks
- ★ Improved VFO circuitry for greater stability
- ★ Tailored for more "power punch" in the voice frequency range
- ★ Improved shielding for TVI-protection and stability, eliminating RF feedback

Revised and tested to perfection, this 10-160M bandswitching transmitter is TVI-suppressed, filtered & bypassed. Built-in VFO. High level Class B modulation with new compression circuit. Pi-Net output, 48-300 ohms. Push-to-talk, antenna changeover relay, time sequence keying. Single knob bandswitching.

Work AM, CW & Single Sideband with the

Sideander DSB-100

100w PEP DSB, Suppressed Carrier



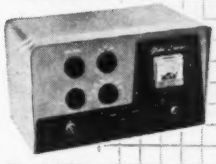
Wired & Tested: **$149.95**
In Kit Form: **$119.95**

Double Sideband, AM, CW at Low Cost

A complete Xmttr., self-contained, bandswitching 80-10M, 100w PEP DSB Suppressed Carrier, 40w AM, 30w CW. Min. 45db carrier suppression. 3-stage RF section allows straight through operation. Automatic balancing & floating grid circuit. Speech clipping & filtering for min. band width. Accessory socket on chassis rear apron. Use barefoot or as driver for higher power Xmttr. Covers most MARS and CAP frequencies.

Globe Linear LA-1

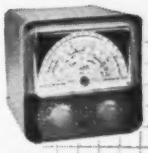
Grounded Grid, Class B or C



W/T: **$124.50**
Kit: **$99.50**

For 6-80M, complete with well-filtered power supply, 200w input AM Class B, 300w DC or 420w PEP input Class B linear SSB or DSB. 300w Class C for CW. Pi-Net 80-10M; 52 ohm Pi-Link coupled on 6M. Extensively TVI-protected. Meter for monitoring final plate currents also indicates approx. RF output voltage enabling operator to tune for max. efficiency and output.

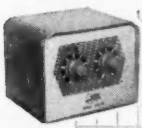
Globe VFO 755A



W/T: **$59.95**
Kit: **$49.95**

10-160M

Complete with well-filtered power supply with voltage regulation. Output on 40 & 160M. Vernier drive with shock absorbing features. 13:1 tuning ratio. Approx. 50 RF volts output. Temperature compensated for utmost stability for DSB, AM, CW.



Vox, Model 10

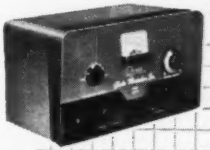
For voice operated control of the DSB-100 as well as the Champ and other similar transmitters. Extra contacts for auxiliary circuits. Simply plugs into rear of DSB-100.

QT-10

An anti-trip accessory for the VOX, Model 10.

VOX, Wired & Tested: $29.95
Kit: $19.95 QT-10: $9.95 Wired

Globe Matcher Sr., AT-4



Wired: **$79.50**
Kit: **$69.50**

Antenna tuner with built-in SWR bridge for any Xmttr. with final RF input up to 600w, 80-10M. Fixed link coupling. Coax input, 2-wire balanced or unbalanced output. Built-in switch allows bypass of tuner circuits for coax input and output. Special calibrated panel meter for monitoring actual SWR. Vernier dial.

Globe Matcher Jr., AT-3

Wired: **$15.95**
Kit: **$11.95**

Antenna tuner for power input 100w CW, 75w fone, or less. Substantial amount of harmonic attenuation when properly tuned. Aids matching Xmttr. output to various antennas. Unbalanced output. Forward Look cabinet of steel for TVI-prevention.

Globe Scout 680A

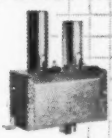
for 6-80 Meters

Wired: **$119.95**
Kit Form: **$99.95**

Plate Modulated — 65w CW, 50w AM

Completely bandwitching, self-contained, with built-in power supply. High level modulation maintained. TVI-shielded cabinet. Pi-Net output on 10-80M, Link-coupled on 6M, matching into low impedance beams. New type, wide view shielded meter. Kit contains all parts, tubes, pre-punched chassis and complete manual.

Power Booster PB-1



Wired: **$21.95**
Kit Form: **$14.95**

For straight through operation on 6M (Scout 680A or 680 only; plugs internally into Globe Scout). Approx. 50% more power output, while attenuating harmonics and further suppressing TVI.

Power Attenuator PA-1

Wired & Tested: **$10.95**

General purpose attenuator for exciters up to 70 watts input. Suitable to attenuate drive between many exciter-amplifier combinations. Standard coax input and outut connectors. Tap switch to select any of three attenuation positions or straight through.

Visit Your Favorite Distributor for Details!

OTHER TOP FLIGHT GLOBE PRODUCTS

Globe King, wired **$795.00**; Globe Chief, w/t: **$74.50**, kit: **$59.95**; Hi-Bander, w/t: **$149.95**, kit: **$119.95**; VFO 6-2, w/t: **$59.95**, kit: **$49.95**; Power Attenuator, w/t: **$10.95**; Plate Modulator UM-1, w/t: **$49.95**, kit: **$32.50** (less tubes); Screen Modulator Kit, **$11.35**; 6-Meter Converter 6PMC, w/t: **$29.95**, kit: **$21.95**; Speech Booster, w/t: **$24.95**, kit: **$15.95**.

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COUNCIL BLUFFS, IOWA

ORSs. KØKMZ continues busy with SNN, operating daily at 1700 on 7152 kc.; also STN at 1730 on 7145 kc. KØGYA is changing locations but will be back in the traffic business soon. UOL is resting after a well-earned strenuous vacation. ETX paid the SCM a flying visit while on a vacation trip. ATH, the XYL, was along. She has sold her receiver to ZUX, who is becoming active again. KØBJR topped Kansas in the 1958 C.W. SS. RJF collected a new certificate from the St. Paul, Minn., Club for first place from Kansas in the CD Party. Hamfests galore are looming. Your SCM will be all over the state during the next three months attending them. Hope to personally receive a report from each club on Field Day. ACAA, the Wichita Radio Club, through *Groundwave*, the club paper, has a very interesting article on the GDO by BMW. CVN will address the club regarding power-line radio interference. Paul is with the KG&E and is very good on this. Traffic: (Apr.) WØBLI 729, FNS 243, QGG 195, IFR 131, RJF 78, SYZ 69, KØBIX 53, WØUTO 44, WWT 40, KØMMF 39, IZM 35, WØABJ 34, KØJVX 22, GIG 20, WØWFD 18, GJG 17, KØGYA 16, WØTTG 14, FDJ 12, LIX 11, DL 8, KØIHJ 8, WØVRZ 7, VUI 7, KØEFL 6, WØFHT 6, LEA 6, LOW 6, BBO 4, KØGEL 4, JID 4, WØASY 2, YIP 2. (Mar.) KØGYA 110. MRI 6. (Feb.) WØOHJ 665, KØMRI 4.

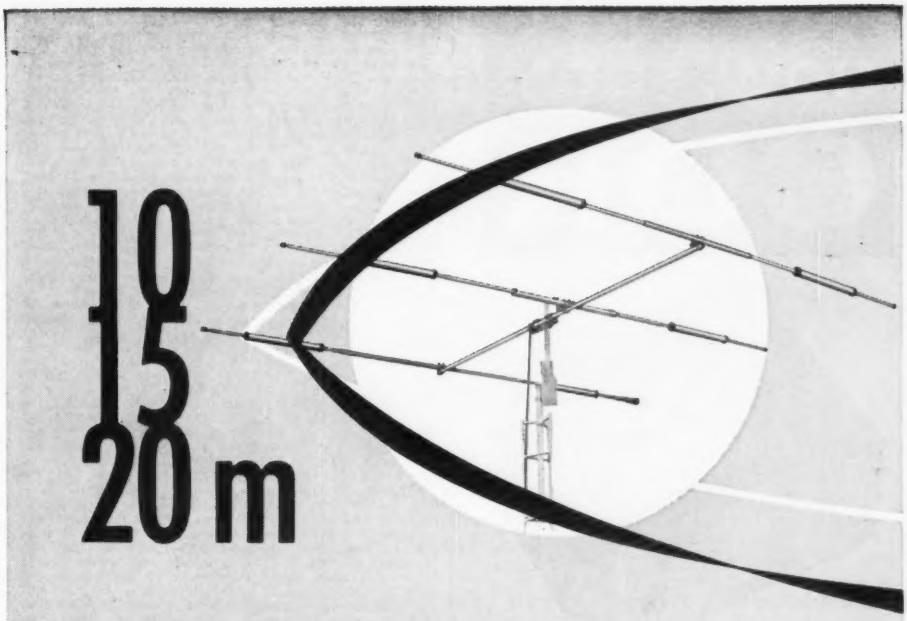
MISSOURI—SCM, C. O. Gosch, WØBUL—SEC: KØLTP. RMs: OUD and QXO. PAMs: BVL, OMM and KØKLQ. Net reports: MON (Mar.) AM & PM Net—52 sessions: QNI 318; QTC 169; NCS OUD 32, KØKBD and RTW 6, KØONK 5, PME 2, KIK 1. MON (Apr.) AM & PM Net—51 sessions: QNI 190; QTC 122; NCS OUD 35, KØKBD 7, RTW 6, KØONK 3. MEN (Apr.)—13 sessions: QNI 445; QTC 103; NCS OHC 3, VPQ 3, OVV 1, OMM 6. CPI and OUD report conditions, traffic and net activities off in the usual spring slump. KØOJC received his RCC certificate. RIP is to be congratulated on the FB RACES and emergency station established in Joplin. It is an FB trailer and jeep combination with built-in emergency power and attached antenna support. This unit was activated for the first time by RIP and KØIHY during the nationwide RACES alert. The Tri-State Radio Society has published a fine convenient-size directory of all area amateurs. GEP reports that it is now official that the ARRL Central-Midwest Divisions Convention will be held in St. Louis Aug. 22-23. Make plans now to attend. KØSGJ reports on proposed activity on 6 meters each Sun. from 1100 to 1600 CST. JHY reports acquiring a new BC-610 and Navy RCH receiver on duty in Little Rock and he is looking for the MON gang. KØJPL won first place in the section in the W. Va.-Mass. QSO Party. KØDGT received an E.E. degree this spring from Rolla and moved to Iowa upon its receipt. The SCM will appreciate copies of bulletins from all clubs in the section. Traffic: (Apr.) WØCPI 754, KØHHG 520, ONK 200, OEP 121, WØOMM 104, OUD 76, BVL 66, KIK 65, KØLTJ 58, OJC 50, WØRTW 38, MKJ 37, ARO 30, ZBR 28, KØLTP 25, WØVPQ 22, WØBUL 17, KØIHY 17. WØIIR 16, KØLGZ 11, WØGEP 10, HFZ 8, LWX 7, EPI 6, GBJ 4, KØSGJ 4. (Mar.) WØRTW 32, WFF 14, EPI 2, IJS 2.

NEBRASKA—SCM, Charles E. McNeel, WØEXP—The Nebraska 75-Meter Phone Net meets daily on 3983 kc. at 12:30 CST and ZWG, the RM, reports QNI 370, QTC 40. The Nebraska C.W. Net reports QNI 118, QTC 100. The C.W. Net has closed down for the summer and will resume drills next fall. DGW reports the Morning Phone Net had QNI 607, QTC 172. The Western Nebraska Phone Net, on 3850 kc. daily except Sun., had QNI 639, QTC 91, as reported by NIK. The new officers of the North Platte Radio Club are OYN, pres.; UFX, vice-pres.; VEA, secy.-treas. Traffic: WØNYU 193, KØDGW 158, WØZWG 127, KØBDF 90, WØNIK 89, KØCDG/Ø 78, WØUOV 78, KØIJW 54, RRL 36, ELQ 24, WØHKI 24, KDW 23, KØKUA 21, FBD 20, WØVEA 17, HOP 16, OKO 16, KØCYN 10, OCU 9, WØURC 9, KØMSS 8, WØHTA 7, JFJ 7, VJZ 6, WKP 6, WZR 6, KØELU 5, WØEGQ 2, KØKJP 1.

NEW ENGLAND DIVISION

CONNECTICUT—SCM, Victor L. Crawford, W1TYQ—SEC: EOR. RM: KYQ. H.F. PAM: YBH. V.H.F. PAM: FHP. Traffic nets: CPN, Mon.-Sat. 1800, Sun. 1000 on 3880 kc.; CN, daily 1800 and 2230 on 3640 kc.; CVN, Mon., Wed. and Fri. 2030 on 145.98 Mc.; CTN, Sun. 0900 on 3640 kc. KN1IHA made BPL. VW placed first in Connecticut in the Feb. F.M.T. He was only 3 cycles off on 3.5 Mc. NVT, QPD and WRG followed VW. YBH reports that CPN met 29 times, handled 467 messages and had an average daily attendance of 33. High QNI goes to YBH, 29; K1AQE, K1BEN, K1GCS, 28; K1ACC, K1BMM MDB, TVU, 27; FHP, 26; K1CRQ, IHG, 25; DAV, VOV, ZQO, 24. K1BNQ has a new baby brother. CHR is busy on a 50-Mc. portable. KN1KEA and KN1KGI, husband and wife, are on 2 meters. VWP is waiting for a call in Fr.

(Continued on page 116)



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Streamlined grace combines with the look of rugged strength to make **MOSLEY Trap Master Antennas** pleasing to the eye and completely acceptable to your neighbors.

Trap Master Antennas *perform*, too . . . thousands of Amateurs in the U.S.A.—and almost every corner of the globe—are glad *they* bought a **MOSLEY Trap Master!**

(Illustrated, is the world-famous TA–33. Rated to maximum legal power, this 3 element beam performs wonderfully on 10, 15 and 20 meter bands. Factory pre-tuned for quick, easy assembly without tedious measuring. AMATEUR NET, $99.75)

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Morocco. FHP advises that CVN handled 56 messages during 13 sessions with 161 stations checking in. High QNI goes to K1BML, K1BMM, FHP, 13; HJG, 11; JZA, ZUQ, 10; FPF, 9. K1ACC worked 150 stations in 39 sections during the CD Party. MBX is mobile with an AT-1 on 29.58 Mc. New awards are WAC and WAMC. SKA is on from a new QTH. K1AZG will be mobile soon. QPD has a pair of 813s on RTTY on 80 meters. YOL added New Hampshire for state No. 22 on 6 meters. YDS is on 220 Mc. K1IDF, K1AOK and JIQ are on 6 meters. ECH made WAC with a 122/104 total. KYQ reports CN handled 454 messages during 30 sessions, including 102 on the second session. Average attendance was 9 stations. High QNI goes to OBR, K1JAD and ROX. PQU has a new Apache. IOB vacationed in Florida. ZTY is enjoying closed-circuit TV. RON is active on 2 meters. GTH is on 10 meters. ZZK has 240 worked and 229 confirmed. ASO is active on 10 meters. IJD and WFJ operate KG1FN from Fletchers Ice Island T-3. GVZ has a 144 worked/131 confirmed country count. No other nominations were received, so I will continue to serve you as SCM for another two years. My sincere thanks for your support. New appointments: DVO/1, K1CEC, IOW, VSE as OOs; K1DPL and VSE as OESs. Renewed: YBH as PAM; AVS as ORS. Reports received: OES from K1DPL, FVV, YOL; OO from K1BNQ, QPD and Traffic: W1KLK 357, OBR 314, YBH 285, KYQ 277, AW 255, KN1IHA 157, W1ROX 126, K1JAD 115, W1TYQ 72, CHR 52, K1ACC 51, W1FHP 48, RFJ 48, EFW 43, MWB 30, K1AQE 28, W1BDI 26, K1GCS 25, CEC 23, W1HBH 23, K1HWF 18, DHU 16, W1ZUQ 15, IOW 13, K1CAK 11, W1FPF 7, K1BMM 6, W1EBW 6, JZA 6, CUH 5, MBX 5, K1BNQ 3, W1SKA 1, YOL 1.

MAINE—SCM, Charles F. Lander, W1QJA—SEC: QJA. PAM: VYA. V.H.F. PAM: JMN. RM: EFR. Traffic nets: The Sea Gull Net meets on 3540 kc. Mon.-Sat. at 1700. The Pine Tree Net meets on 3596 kc. Mon.-Fri. at 1900. The Barnyard Net meets on 3960 kc. Mon.-Sat. at 0800. K1DUG is mobile with a nice signal. It is with deep regret that we note the passing of GLZ to Silent Keys. It looks like KEZ is the only EC interested enough to send in annual reports! EZR has been appointed EC for the Lewiston-Auburn Area. Has anyone heard LKP from W6-Land? Don't forget the hamfest coming up in Augusta, fellows. There will be a chance for you fellows to take your exam for a ham ticket right there on the spot. VXU or any Augusta station can register you at any time. Let's enumerate the mistakes we made in the April 17-18 Operation Alert and not make the same ones in the next test. Now that the mobiles are out in goodly numbers, how about Net Control Stations who are sometimes "quick on the trigger" using a mobile call-up a couple of times during net operation in order that the fellow on a lonely highway may have a chance to call in from his weak mobile and keep his net attendance record from sagging? While on the subject, let's remember, fellows, that these NCS guys have a thankless job in trying to maintain some order in the process of running the net. While NC calls a particular station (and that station only) and comes up with several stations QRMing each other in order to holler "QRU," that's exasperating. Also, there are those who persist in calling in when traffic is being passed between stations and a short break for a "fill" appears, when several stations QRM for a QRU! Let's listen for a "call-up," fellows. Traffic: W1QJA 143, GPY 114, CEV 98, UDD 56, K1DEG 50, W1ISO 47, FV 45, EFR 41, BX 15, K1GAV 13, DWO 11, JWT 8, BYE 5.

EASTERN MASSACHUSETTS—SCM, Frank L. Baker, jr., W1ALP—New appointments: ENS Arlington, K1BAF Lynn as ECs. Appointments endorsed: LL No. Attleboro, DWY Beverly, YYI Carlisle, KT Georgetown, AKN Sandwich, AR Belmont, MME Hull as ECs; NTK, AOG, AR and MME as OPSs; NTK and RCQ as ORSs; AHE as OES; MME as OBS. ALP spoke at the Burlington and Hingham Clubs. ACB spoke on MARS AAU and ALP visited PI in Newton. KN1KKS is NJ's son. ZOC is back on the air. Heard on 2 meters: KN1s KHP, KLB, KOB, PEX and K1GVO. K1GKF, AYG, BHW, BB, AGX, SMO, DEI, PXH, TZ, WK and PLJ took part in the Feb. F.M.T. HUP is over in Geneva, Switzerland, for 2 years. TYA is on again and his XYL, KN1JUW, is doing fine. HFX is on 10 meters. SSU has a Viking I and is on 10 and 75 meters. K1KIN is on in Woburn. CTW spoke at the QRA. MX held an auction. The T-9 Club met at Hum Kennedy's QTH. FBT spoke at the South Shore Club on some new equipment. LL says he has 11 Gonsets for c.d. in his town. ABJ is active again. HIC has a Gonset III on 6 meters. K1HRM and KN5TEP/1 passed the General Class exam. LMZ made a trip to the Midwest. K1GQZ has a 522. KN1HBA has his Tech. Class license. APB, K1CUH, KN1s KLB and KKZ are on 2 meters. UIR and K1GQZ have new beams on 2 meters. A meeting was held in Quincy of the various traffic nets in this section with the following present: BVR, DGL, MNG, DFS, IAE, K2RMQ/1, K1GGI, GRP, NTK, ALP, SS, UIR, EAE, TY, OFK, KN5TEP/1,

(Continued on page 118)

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K1GQZ, ADH, ADU, CUH, CAU, W1NJL, QFO, OSK, KYC, BYH, VJC, ETZ, EMG and ZSS. Jon McAlear, Needham, has 50 watts on 6-40 meters. The Chelmsford Club was on during the Alert and had an auction and banquet. BGW is getting set up at a new QTH. New officers of the Braintree Club are KPX, pres.; QVN, vice-pres.; QPT, secy.-treas. KT has a Valiant GPR-90, a three-element beam and a Windom antenna. The Carlisle group was on during the Alert. HIL has an Apache 6N2 v.f.o. working on the antenna. K1JDF is on 6 meters. The Framingham and Malden Clubs held auctions. K1AQI handled some emergency traffic for Dr. Paul D. White. MRQ's XYL is KN1JYD and his son is KN1KDN. Other new ones in Groveland are KN1s KGW, KHD and KHO. The Sector 2-D Net, with TZ, ALP and HSN, was very active during the Alert. The Franklin Radio Club had a farewell banquet for MNW, who is going to Los Angeles, Calif. NF worked KS4BB. UE was away on a trip. COL, our Cambridge EC says FMW, HIT, SAD and KN1GVK were on during the Alert and they have a new Gonset on 2 meters. K1GRIP, EUT, K1CMS and ADH made BPL. MHL/1 was in the V.H.F. Contest from New Hampshire. K1ILA and IKX are in the hospital. K1ADH participated in OPAL. K1DIO is working on a 220-Mc. rig. PEX has a DX100, an SX43 and a Gonset II. He is deputy for Comm. of Mass. Wing, CAP. BIO is on the air. IBE is the weather information station for Cape Ann for WBZ-TV. KN1HBY is waiting for his Tech. Class license. K1QPH is on 2 meters again. ETH is on 10 and 15 meters. Traffic: (Apr.) W1AWA 681, K1GRP 572, W1EUT 332, NJL 322, K1ADH 303, CMS 302, W1EMG 298, K1DIO 157, W1HGN 144, K1BYL 121, W1EAE 90, K1DGI 83, W1OFK 71, LMZ 40, PEX 25, ZSS 25, K1BCL 24, W1QFO 23, KBN 20, TY 19, UKO 19, SIV 18, GEK 16, FJJ 15, K1JML 15, W1AKN 13, KYC 11, K1DEY 10, EAV 5, W1HIC 5, IBE 5, KN1HBY 4, W1WAW 4, K1GPH 3, W1TQQ 3, ETH 1, SSU 1. (Mar.) W1AOG 15, K1GPH 2.

WESTERN MASSACHUSETTS—SCM, John F. Lindholm, W1DGL—Asst. SCM: Richard J. Kalagher, 1KGJ. SEC: BYH. RM: BVR. PAM: MNG. The West Mass. C.W. Net meets on 3560 kc. at 1900 Mon. through Sat. The Mass. Phone Net meets daily on 3870 kc. at 1800. The West Mass. Novice and Slow Speed Net meets Tue., Thurs. and Sat. on 3744 kc. at 1830. New appointments go to DZV as EC for Fitchburg, K1GCV as OO and LVL as OES. DZV has been endorsed as OBS. MUN again led the Western Mass. gang in the February Frequency Measuring Test, with QQO, RLQ and MBL close behind. KN1ILP, of Leominster, and KN1IKD, of Fitchburg, have passed the General Class exam. TAY has a DSB-100. AJX has a new antenna coupler. ZPB is working on a t.r. switch and modifications on the DX-100. DUP has a new Johnson t.r. switch. QWJ has built a new receiver. Your SCM, SEC, PAM and RM attended a very FB net meeting in Quincy called by the Eastern Mass. PAM. All our nets are looking for outlets in Pittsfield. K1BOX is constructing a kw. final for v.h.f. WF has earned a VK-ZL certificate. From the talk floating about, Field Day should find many Western Massachusetts stations active. K1BBD has a Viking II on 10 meters. I hope that when this is read, I shall have met many of you at the Massachusetts Convention at Swampscott. It appears as though there is a possibility of forming a section net on 6 meters. V.h.f. men, please express any opinions on this to our V.H.F. PAM, RFU. Have a good summer, gang! Traffic: (Apr.) K1CAU 90, W1BVR 86, DGL 86, TAY 51, ZPB 33, DXS 27, OSK 26, AGM 15, AJX 14, K1GCV 4, W1BYH 1. (Mar.) W1TAY 28, DUP 10, JYH 8.

NEW HAMPSHIRE—SCM, Robert H. Wright, W1RMH—SEC: BXU. RMs: K1BCS and K1CIF. PAM: IIQ. V.H.F. PAM: TA. K1BGI announces the formation of the Contoocook Valley Radio Club, Inc., as a memorial to the late K1BKE. Officers are MAS, pres.; K1BVU, vice-pres.; Louise French, secy.; Janet Willard, treas. Meetings are held the last Thurs. in the month, with 30 members at present. New officers of the UNH Amateur Radio Club (ASZ) are K1ELY, pres.; CSW, vice-pres. and treas.; IUW, secy.; and KN1IBZ, act. mgr. Work is progressing on a 400-watt 6- and 2-meter rig. The Manchester Radio Club has new antennas for 80 through 1¼ meters. IJB has a WANE award and 204 countries confirmed. TTU has a WAC certificate with special two-way s.s.b. endorsement. The White Mountain Moonshiners Net meets Mon. and Wed. at 8 P.M. on 50.4 Mc. Anyone who checks in three times is eligible for the certificate award. VAU is now Class I OO. EVN is a new ORS in the Keene Area. Appointment holders: Please check your certificates for the necessary yearly endorsement. How about your secretaries keeping me posted on your club's activities? Traffic: (Apr.) K1BCS 569, CIF 327, IIK 114, BOO 37, W1EVN 20, YHF 19, MOI 16, K1CSJ 15, W1IIQ 11, K1BHD 8, W1CUE 6, KVG 6, MKA 6, AIJ 5, MTX 4, BYS 2, K1DKD 2. (Mar.) W1MOI 32, HKA 17, IIQ 9, MTX 6.

(Continued on page 120)

THE REVOLUTIONARY NEW CENTRAL ELECTRONICS 100V EXCITER-TRANSMITTER

BROADBANDED! ONLY ONE TUNING CONTROL, THE VFO ITSELF.

CENTRAL ELECTRONICS, THE PIONEER OF AMATEUR SSB IS PROUD TO BRING YOU THE FINAL RESULT OF THREE YEARS OF THE KIND OF PATIENT ENGINEERING, TESTING AND IMPROVING THAT MAKES FOR A SUPERIOR PIECE OF ELECTRONIC GEAR.

MANY OF THE TRIED AND TRUE PRINCIPLES AND FEATURES OF THE ORIGINAL MULTIPHASE EXCITERS HAVE BEEN RETAINED IN THE NEW 100V, ALTHOUGH IN VASTLY IMPROVED FORM. THE USE OF PATENTED BROADBAND CIRCUITRY THROUGHOUT PRACTICALLY ELIMINATES "COCK-PIT" TROUBLE.

REGARDLESS OF YOUR PREFERRED MODE OF OPERATION, IT'S ALL IN THE 100V. SSB, DSB, AM, PM, CW and FSK . . . AND ALL AT THE FLIP OF ONE SWITCH. ALTHOUGH THE 100V WILL PROBABLY FIND ITS GREATEST USE AS A SINGLE SIDEBAND SUPPRESSED CARRIER EXCITER-TRANSMITTER . . . NO ONE HAS BEEN "LEFT OUT IN THE COLD" IN ITS DESIGN. THIS IS THE KIND OF A RIG THAT HAMS DREAM ABOUT!

CHECK AND COMPARE THESE FEATURES

STABILITY: The new patented two tube permeability tuned VFO circuit is exceedingly stable and is immune to the effects of line voltage fluctuations and tube ageing. Built like a battle ship, it is tuned by a husky precision lead screw assembly running in ball bearings. This is a VFO to end all VFO's.

FREQUENCY COVERAGE: 80 METERS — 3.5 to 4.5 Mc. 40 METERS — 6.5 to 7.5 Mc. 20 METERS — 13.5 to 14.5 Mc. 15 METERS — 20.5 to 21.5 Mc. 10 METERS — 27.7 to 29.7 Mc. A spare X position provides for the installation of broad-band coils for 160 meters, MARS, etc. OR any 1 Mc. portion of the spectrum between 1.5 Mc. and 25.5 Mc. OR any 2 Mc. portion of the spectrum between 25.5 Mc. and 29.7 Mc. YOU DON'T SETTLE FOR HALF A LOAF OF FREQUENCY COVERAGE WHEN YOU HAVE A 100V!

THE TUNING DIAL: Band scales in the large slide rule window change with the band switch and are calibrated at each 100 KC point. Frequency is read directly in 1 KC increments by the circular KC dial without any computation whatever. Approx. 12 feet of bandspread on each band. A smooth running two-speed tuning knob allows fast tuning at 100 KC per turn and slow tuning at 750 CYCLES per turn. Calibration accuracy is 250 cycles between any two 50 KC points.

METERING: Reads POWER INPUT (0-200 watts) RF AMPS OUTPUT, AC LINE VOLTAGE and CARRIER SUPPRESSION IN DB DOWN TO 70 DB.

MONITORING: A 2" scope provides an instantaneous visual check on non-linearity resulting from improper loading. Also indicates proper setting of carrier injection for 100% AM modulation. Scope presents trapezoid pattern.

OTHER INDICATORS: Below the meter a neon indicator provides a check on the operation of the NEW AUDIO LIMITER CIRCUIT. Below the scope a second neon indicator starts operating if you have the antenna or load mis-matched.

NEW AUDIO FILTER-LIMITER: The new filter is composed entirely of R-C components, yet has the steep side response and rejection characteristics of a four toroid tuned filter but without the usual harsh, ringing effects. Bandpass is 200 to 3700 cycles. This filter precedes the phase shift system and will maintain 50 DB SUPPRESSION OF THE UNWANTED SIDEBAND. The new audio limiter maintains audio drive to the balanced modulator WITHIN 1 DB, REGARDLESS OF HOW HARD THE MIKE IS HIT. IT'S IMPOSSIBLE TO OVERDRIVE THE 100V BALANCED MODULATOR! Inverse feedback circuits allow 10 DB OF CLIPPING with negligible distortion.

NEW PS-2 AUDIO PHASE SHIFT NETWORK: A twelve cross-over point network is composed of heat-cycled components having .1% accuracy. Even changing the balanced modulator tubes has no effect on its maintaining 50 DB OR BETTER suppression!

POWER OUTPUT: The husky, ultra-linear type 6550 tubes in the final of the 100V will deliver 100 WATTS OF SINGLE TONE POWER, EVEN ON TEN METERS! AND WITHOUT GRID CURRENT FLOW. Two tone third order distortion products are down in excess of 40 DB. A new POWER OUTPUT CONTROL eliminates the need for power dividers when driving AB1 or AB2 linears, since power output is continuously variable from 10 watts to full output.

SET AND FORGET CONTROLS: These seldom used controls are all located behind the flip down magnetic doors on the front.

GENERAL CIRCUITRY: Crystal controlled master SSB generation is at 8 MC. VFO injection is 5 to 6 MC. Crystal controlled heterodyne oscillators operate into mixer stages for various bands. This system, originally developed by C. E. is today the standard of the industry. Blocked grid keying of mixers and final amplifier provides perfect CW and PHONE BREAK-IN.

PHYSICAL DATA: Panel is standard 19" width by 8¾" high. Finish is smooth grey. Attractive heavy duty rounded corner cabinet is 15" deep, is finished in grey wrinkle and has a latch type access lid. Shipping weight approx. 90 lbs.

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A NEW HETERODYNE CONVERTER: To cover all of the 2 and 6 meter bands with the 100V. Interlock control sockets are in the 100V.

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RHODE ISLAND—SCM, Mrs. June R. Burkett, W1VXC—SEC: PAZ. PAMs: KCS and YRC. RM: BBN. Endorsements this month: KCS as PAM and OES, TXL as OPS. YKQ is the new Radio Officer for the Town of Johnston. YAO is now mobile on 10, 15 and 75 meters with a Gonset Commander and reports excellent results. New stations are welcome to join the Rhode Island Novice Net, which meets on 3742 kc. at 1800 on Tue. and Thurs. K1DUY has been issued a Section Net certificate (RIN). GR, who is doing an excellent job as Class I OO in Rhode Island, is now active on 144 Mc. as well as his favorite DX bands, 10, 15 and 20 meters. K1DNC and K1JTJ are new Generals. At the annual Providence Radio Association's Dinner Dance held on May 9, TQW was presented with the club's "Most Outstanding Amateur of the Year" award. K1AEW is planning to go side band and K1EGH and K1EGD have mobile plans. Traffic: W1SMU 385, TXL 93, VBR 84, YRC 19, WED 10, KN1HQE 10.

VERMONT—SCM, Harry A. Preston, jr., W1VSA—SEC: EIB. RM: K1BGC. PAM: ZYZ. Asst. PAM: K1GLO. Frequencies used in Vermont: C.W. 3520, phone 3855, VTN Mon.-Sat. at 1830 (c.w.), VTPN Sun. at 0900 (phone), GMN Mon.-Sat. at 1700 (phone), VEPN Sun. at 1700 (phone). K1BSN is K1AUE's brother and is running 500 watts from E. Calais. The Emergency Communications Workshop, organized by our active SEC, was rated high by many of our fellow amateurs. If you would like to see something of this type again, let our SEC know. Our guest at the meeting was NJM, ARRL. Some 45 persons attended the meeting at Williamstown, Vt. The BARC, Inc., now has an emergency trailer. Parks has a new Gonset Communicator III. ZJL has a new Volkswagon and a 2-meter walkie-talkie. A new club in the Barre-Montpelier region is the Central Vermont Amateur Radio Club. NDL is chairman, ZEW is secretary. The XYL of IVT is now K1KQY. K1HNQ, of St. Albans, has dropped the "N." We need an active outlet from Rutland on the nets. Hope to meet you at the Vermont Phone and C.W. Picnic this summer. Traffic: W1OAK 176, VSA 83, K1BGC 49, W1ELJ 46, KJG 44, EIB 27, K1BQB 25, GBF 20, W1HRG 15, K1AUE 12, DQB 11, GBE 9.

NORTHWESTERN DIVISION

ALASKA—Acting SCM, Kenneth E. Koestler, KL7BZO—The Alaskan State Hamfest will be held July 17, 18, 19 at Anchorage. Civil defense activity is on net frequency 145.3 Mc. A point system is used to qualify new amateurs to receive c.d. equipment. New officers were elected and AUV, the president, is just returning from a vacation outside with his family. Now you can find him back on the bands in KL7-Land. There are a number of new Novices here in Alaska and are all looking for WAS on the 15-meter Novice band. Traffic: (Apr.) KG1DT 501. (Mar.) KG1DT 510.

IDAHO—SCM, Mrs. Helen M. Maillet, W7GGV—Officers of the Big Springs WIMU Hamfest met at GGV's QTH to plan new ideas, games, eats. The hamfest is scheduled for July 31, Aug. 1 and 2. The Idaho Radio Amateurs, Inc., is gathering factual information for delegates to the Geneva Conference; is planning a statewide hamfest at Boise for June and elected HPH and OA to the board of directors. Club station K7AXM, headquarters for the C.D. Alert, handled 57 confirmed messages on 2 and 75 meters. RKI told the Rotary at Driggs about ham radio. AOR got first prize for a voice solo and K7ATO's band got first at the high school music festivals. ISI and K7BCE have new daughters. IZM has a home-brew mobile rig on the air. DPD is looking for 2-meter contacts on a.m. RACES District 6 is setting up 2-meter activities on f.m. VQC's daughter is now a WAVE in the communications section. DUP is taking a summer electronics course at Montana State University. Traffic: W7VQC 23, GGV 7, K7GHX 2, W7JHY 1.

MONTANA—SCM, Vernon L. Phillips, W7NPV/WXI—MPN meets M-W-F at 1800 on 3910. MSS meets T-T-S at 1900 on 3530. III joined Silent Keys Apr. 6. Harold was crushed when a Weasel accidentally tipped over on him on a mountainside near Havre. Amateurs at Harlowton, Roundup and Miles City handled emergency communications during the severe snow and sleet storm of Apr. 16 and 17. 1BUD, from ARRL Hq., met with amateurs at Great Falls and Billings. YHS and K7AEZ made BPL. HVS was commissioned in the USAF. K7AEU/5 was named Soldier of the Month at the White Sands Missile Range. CPY and AYG/GQI returned from winter vacations in Arizona. K7ANZ moved from Butte to Rexburg, Idaho. HFZ moved from Lewiston to Hobson. IHT moved from Cut Bank to Billings. KN7-HWN, HWO, HWP and HWQ are new calls in Harlowton. All are YLs and the same family. K7DGE and K7DPH are new Conditionals. K7DGQ broke an arm while playing baseball. The Silver Jubilee of the Glacier Hamfest will be held at Apgar, July 18 and 19. Traffic: W7YHS 306, K7AEZ 177, W7SFK 72, K7EWZ 57, BYC

(Continued on page 122)

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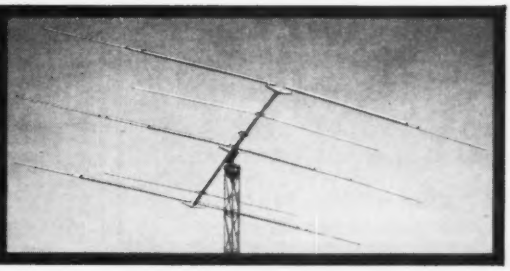

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38, DVZ 18, W7MQI 8, TGM 5, BKB 4, LBK 4, NPV 4, K7AWD 2.

OREGON—SCM, Hubert R. McNally, W7JDX—The annual Oregon Convention is now history but will go right along with past conventions. A crowd of about 520 greatly enjoyed every minute of it, especially the talk by A. L. Budlong, W1BUD. It was the first real dope any of us have had on just what plans are being devised to protect our frequencies. The Roseburg gang is to be congratulated on a very fine convention. ZB and BDU have done it again, BPL and how! Which only points up the very fine activity now on OSN under the capable leadership of AJN. Two new ORSs are K7CLL and K7CNZ. If you fellows interested in c.w. will look over 3595 kc. around 7 P.M. some evening you will find a swell gang at work. DUN is the new EC for Wasco County. UQI sure is doing a fine job as SEC and has most all the gang on their toes now. Oregon RACES took part in Operation Alert. Those active were KY, OZL, ALG, GWB, GLZ and NGW. The press had a nice write-up on the c.d. activities of the Clackamas County gang. The OARS elected new officers and is expecting a bang-up year. SNA made DXCC. The Moresco gang of Clackamas, Benton and Linn Counties had a swell drill, showing what can be done in mountain rescue cases. My years as SCM are up but I don't know if I have a successor or not. Anyway, thanks for the swell cooperation, gang. Traffic: W7ZB 708, BDU 506, K7CLL 215, W7LT 111, ZFH 106, MW 61, AJN 38, K7DRS 35, CNZ 34, W7BVH 27, K7EPO 21, W7OMO 19, DEM 5, EZH 5.

WASHINGTON—SCM, Robert B. Thurston, W7PGY—The Budlong meeting held in Seattle Apr. 29 was attended by some 240 amateurs from the west side of the mountains. Twenty-four officers and various appointees from the different clubs in Seattle Area attended the No Host Dinner for Mr. Budlong prior to the meeting. AVM is monitoring 53.29 Mc. f.m. for visiting mobiles in the Aberdeen Area. FIX has a big transmitter going and now is looking for better antennas. EMX reports excellent DX on 50 Mc. in March. RGL overhauled the shack and transmitter gear. YFO is working on a new final. New check-ins on WARTS from the Richland Area are K7DCU and K7BFI. PN vacationed in KZ5-Land. YLW is off the air because of the transformer in the big rig going sour. A new teen-age net called the Western Amateur Teen-age Traffic System (WATTS) operates Sun., Wed. and Fri. at 1700 PST on 3815 kc. UWT reports that 13 AREC members participated in the C.D. Drill held Apr. 17 on a 24-hour sked. The Spokane Radio Club held a banquet Apr. 4 with 119 persons in attendance. The WSN Net had 22 sessions and 245 QNIs last month. NV headed c.d. exercises in the Spokane Area on Apr. 17. AMC is looking for members for the 40-Meter C.W. Net. AIB has a new Valiant transmitter. DPW is NCS of RN7 on Mon. New appointments are K7GNA and IEU as ORSs, WHV as OBS, HMQ and K7DDQ as ECs. WAH renewed his ORS appointment. QLH now is acting mgr. of RN7. IEU is working on TBY8 for 10- and 6-meter portable use. AUK received a letter of commendation from Coast Guard Headquarters in Seattle. FWD, joined the ranks of Silent Keys May 4. VPW is installing a new tower and beam. Traffic: W7BA 2111, PGY 966, DPW 487, DZX 393, QLH 308, HUT 186, K7ABB 141, W7APS 125, OEB 69, AMC 54, IEU 48, HSC 34, K7AJT 33, W7EKT 32, AIB 29, KZ 24, USO 23, K7ETP 19, W7JC 17, K7GNA 16, W7YFO 13, LFA 11, REC 11, EVW 9, K7CHD 8, W7OBH 8, UWT 8, EKQ 2, KN7GGA 2.

PACIFIC DIVISION

NEVADA—SCM, Charles A. Rhines, W7VIU—The NARA is planning FD activity and starting simultaneous 10- and 2-meter transmitters hunts and also has applied to the FCC for permission to operate a 2-meter repeater on Slide Mt. KN7HRW, a new ham in Reno, has a Mosley TA33. He and EEF have joined the MARS V.H.F. Net. EEF is on 2 meters with a homebrew 5894 final. CX has a new Seneca. MAH finished the 4X250Bs final on 2 meters. PC has joined your SCM in dieting. ØOIQ is stationed at Stead AFB. HOP, Humboldt Co. EC, is planning a 2-meter mobile-emergency net. NWU and OLF have joined Silent Keys. Nevada Net certificates went to IWT, JCY and K6EE/7. K7EBJ got married and moved to Los Angeles. K7AHA is rebuilding the p.p. 813s final; VIU the same with parallel 4-250As. YNO is attending Navy teletype school in Virginia. K6HGV was awarded Nevada Certificate No. 67. Traffic: W7VIU 341, IWT 6.

SANTA CLARA VALLEY—SCM, W. Conley Smith, K6DYX—Asst. SCM: Frank J. Pacier, W6VMY. SEC: W6NVO. PAM: W6ZLO. RMs: K6EWY and W6PLG. Operating as XEØBMP, K6BBD acquitted himself well during a real emergency. W6SXG had a 2-meter rig at her bedside while in the hospital. Ruth says she appreciated the many pleasant QSOs. K6EER directed a communications group comprised of W6SXG, W6OWP, K6EOO and K6CQV which assisted in the Jerrie Cobb 2000-kilometer

(Continued on page 124)

speed record flight on Apr. 13. W6WNI, ORS, holds weekly skeds with his son, KN5SUU, in Texas. Another father-and-son team, K6OEJ and W6WIG, are active in SCARS c.d. drills. W6DEF reports the SCARS made a fair showing in OPAL '59 in spite of the late notices. Congrats, gang. In the real thing there won't be any notices. WA6CLT still is looking for Vermont for WAS. No luck in the Apr. CD Party. W6YHM visited ARRL Headquarters during a trip East in May. OOs W6ASH and W6CBX both were well within Class I accuracy in the recent F.M.T. OOs W6CBX and K6SRG are doing a fine job. They missed a couple of "clickers," though, who got FCC notices after, of all things, a QSO at 7 A.M., of a Sunday morning! Traffic. (Apr.) W6RSY 433, K6DYX 426, K6GZ 134, W6YBV 104, W6AIT 79, W6HC 76, W6DEF 35, W6ZLO 25, K6YKG 24, W6OII 22, W6YZE 22, W6FON 20, WA6CLT 5. (Mar.) W6HC 141, W6LKV 128, K6YKG 29, W6YHM 28, W6PLG 14.

EAST BAY—SCM, B. W. Southwell, W6OJW—Asst. SCM: Mary Gwynne, W6PIR. SEC: W6CAN. ECs: W6LGW, W6ZZF, W6IUZ, K6EDN, K6JNW and K6QZG K6GK makes BPL again. K6ZBL is working on v.h.f. and RTTY gear and reports a Mars traffic count of 65. K6OSO reports that new Novices in Berkeley are WV6EIQ, WV6ERH, WV6EWE and WV6ERY. WV6DVC is sweating out his Tech. Class ticket. The East Bay ARC toured KGO-TV. K6IGN reports 5 Generals, 2 Novices and 4 faculty hams now at Richmond High School. K6DMI is active on MARS. The CCRC held its April meeting at the San Francisco Radio Club. The EBRC had a big auction Apr. 10. New Novices in the Dixon Area are WV6FKN, WV6FJR, WV6FLC, WV6FLD and WV6FLE. K6JIT is active on 50 Mc. with 50 watts to a 6146 and a crystal-controlled convtrter to an NC-183D receiver. W6AIL is the new vice-pres. of the MDARC. K6KYT is on a 5-week business trip to Holland, Belgium, Austria and Switzerland. W6AIL now has his 7-Mc. WAC. K6OSU has a new Modulator with 6L6s in AB_2. K6TBQ is on 75- and 40-meter phone with 300 watts. W6LKM, K6EMR and W6RVC are working on TVI problems. The HARC held an auction of ham gear. New members of the HARC are W6UUE, WV6CJU, K6TVS, WV6AWW, WV6EJA and WA6CQP. K6SWY has a rotator for his Tribander. The NCDXC held its April meeting at the Coit-Ramsey Hotel in Oakland. Keep those reports coming, gang. The deadline for news is the 3rd of each month. Traffic: K6GK 605, W6JOH 93, K6OSO 62, K6ZBL 20.

SACRAMENTO VALLEY—SCM, Jon J. O'Brien, W6GDO—Asst. SCM: William Van de Kamp, W6CKV. RM: W6CMA. PAMs: W6ESZ and W6PIV. League appointments are open for OPS, ORS, OES, OO, etc. Contact the officials listed above for information. W6CAS is building another kw. final. K6GDS is FD chairman for the SARC. K6GQH has a new 75A-4 and a GSB-100. W6LQT has a new tri-band quad and 600-watt rig. K6QWB, v.h.f. man, has a TA-33 and s.s.b. on the "DC" bands. K6TTG is active on 10, 15 and 20 meters with an Apache and a TA-33. W6KKN is on 10, 15 and 20 meters with a Viking II and a TA-33. WV6CCI has a 30-ft. ex-phone pole. W6ZOH is FD chairman for the NHRC. The GEARS have a "Novice crystal bank." WA6AMI and K6ASZ are mobile on 1980 kc. in Chico. K6IF has a new HQ-170. W6OKU has a new TA-33 and 60-ft. crankup. K6ER is having fun with a new NC-303. WV6ERZ is a new call heard in Chico. K6HHD is NCS of the Sacramento 144-Mc. C.D. Net at 7:30 P.M. Tue. on 147.12 Mc. with an average check-in of 40 stations. W6SYX is building 160-meter gear. W6YLH is active in the new c.w. net on 51.3 Mc. at 2130 Mon. in the Marysville Area. W6OJB maintains regular skeds with W6NTV in Turlock on 432 Mc. from Orangevale. W6YSD gave an interesting talk on antennas and transceivers at the SARC meeting. W6HSB/W6HTS have a new TA-33. K6DBA is on 80-meter RTTY. W6VBU has a new f.s.k. exciter. K6QKB is converting the ART-13. W6YKU has received her license. K6PBG now has his Conditional Class license. W6FOD and W6KME sked Mon. on 75 meters. W6GDO/K6HHD have a new final and a TA-33. W6AF is building QRP for 40-20 meters. Traffic: K6SXX 55, W6CMA 45, W6QNI 7.

SAN JOAQUIN VALLEY—SCM, Ralph Saroyan, W6JPU—The Fresno Amateur Radio Club held its Annual Hamfest at the Fairgrounds May 2 with 184 attending. W6UBK won a 15-meter beam. W6USV won a Balun. W6LOS is now a grandfather. K6ZCD is having bandswitching troubles in his s.s.b. exciter. W6PXP has a new "S" line. W6SMS got himself a 75A-3 receiver. K6GTI is installing mobile gear in his new station wagon. W6FXV has a new Drake receiver. W6JPU has a 75A-4 receiver. W6SQP is getting on 2 meters. K6SEV is building a final using a pair of 812s. K6QOK painted the club trailer, doing a fine job. W6TRP is on 10-15-20-meter s.s.b. working DX like crazy. W6HTM is on s.s.b. with a pair of 4E27s in the final. The San Joaquin Valley Sectional Net meets at 6:30 and 8:30 on 3915 kc. Everyone is invited to check in and get acquainted.

(Continued on page 126)

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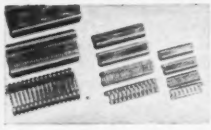

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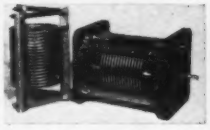

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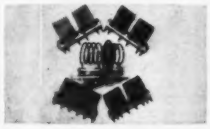

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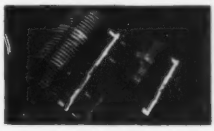
Rated to 500 watts. Variable center linked coils. Eight plug mounting bar. Provides for simplicity in switching fixed or multisection capacitors in final tank circuits.



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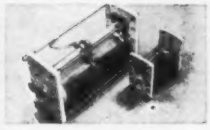

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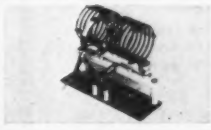

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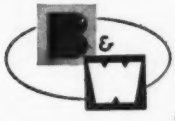

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W6HQY is back on the air with a Viking II. W6GIW, K6IXA, K6SNA, K6DYM, W6HAB, W6FEJ, W6GYN and K6RPL helped out in giving a radio demonstration to the Boy Scouts at the Camporee at Camp McConnel. W6RFX is now in Banning. W6BWM is active on 75-meter phone. W6WIM is active on the Mosquito Net. K6AXV is working on a 6-meter transmitter and W6RRN is working on a 6-meter receiver for FD. K6HMK is working on 220-Mc. gear. K6EUY is working on 2-meter gear. W6ADB is battling arthritis. Keep the news rolling in. Traffic: (Apr.) K6CPQ 378, K6EJT 60, W6ARE 8, W6USV 3, K6AXV 1. (Mar.) K6EJT 62.

ROANOKE DIVISION

NORTH CAROLINA—SCM, B. Riley Fowler, W4RRH—SEC: HUL. PAM: DRC. V.H.F. PAM: ACY. RM: PNM. OPAL '59 has come and gone and the section did very well. A few rough spots were found, but these will be ironed out as the State RACES Radio Officer has the time to get them straightened out. PNM did an excellent job with the C.W. Net, and had some excellent reports on 2-meter activity. An excellent report was received from FTE on the activity in his area. ACY reports excellent results in his area. Other areas that reported are Buncombe, Burke, Catawba and Gaston Counties. The directors of the Tar Heel Emergency Net held a meeting the week end of Apr. 24-25. We have no definite report of what transpired, just the usual announcement on the net. After several tries I find the following are now directors: Three-year term, K4CHU and K4CXN; two years to go, BAW and QC; one year to go, EYZ and HUL. HUL was elected net manager. All directors are east of Winston-Salem. The western part of the State is without representation. At the rewriting of the rules it was understood that ALL parts of the State were to be represented. All these men are excellent men and fair men, but maybe that is why I keep hearing about a Western North Carolina Net on 75 meters. Traffic: K4BUJ 1354, W4GXR 366, DSO 457, RRH 217, BAW 21, ROB 14, WE 12, BBZ 10, K4DNW 6.

SOUTH CAROLINA—SCM, Dr. J. O. Dunlap, W4GQV—SEC: K4PJE. RM: K4AVU. PAM: K4IIE. JCP was appointed EC for the Rock Hill Area. VJI and HMG are new OBSs and marker stations for the S.S.B. Net. The South Carolina S.S.B. Supper was held at Holiday Inn in Columbia. K4EGI was MC. TWW was elected net mgr.; FFH, traffic mgr.; K4QMZ, secy.-treas. TWW encouraged the handling of formal traffic on net and traffic reports. HMG suggested net rule changes which were adopted. GQV discussed League affairs and the forthcoming World Conference at the Columbia and Spartanburg meetings. K4AVU reports good progress and increasing participation in the S.C. Slow Speed Net on 3785 kc. at 2000 Mon. through Fri. The SOP for calling the SCFN as suggested by K4IIE, PAM is found in the May issue of *Scarab*. K4VBO and the Barnwell Club are commended for assistance in a recent drowning tragedy. Under the leadership of ZEQ, the Spartanburg RC held an "XYL Appreciation Banquet" and elected visitors AKC, GQV and K4BVX as honorary members of the club. Communications were furnished for the Explorer Scouts Circus on Apr. 21 and for the Peach Blossom Golf Tournament Apr. 25. K4LSI obtained 12 new AREC members for the Cheraw Area. Traffic: K4GAT 202, AVU 116, WCZ 115, PIA 99, W4AKC 77, CJD 53, FFH 52, K4HQK 52, W4DAW 39, K4VVE 30, W4GQV 29, PED 24, CHD 19, K4LNJ 19, W4KVF 16, K4RUY 14, PJW 12, IIE 10, W4HDR 5, K4PIK 4, W4ARE 2.

VIRGINIA—SCM, John Carl Morgan, W4KX—Nets: VSN (Va. Slow Net) Mon. through Fri. at 1830 EST on 3680 kc. VN: 1900 EST daily, 3680 kc. VFN: 1900 EST daily 3835 kc. The VSN gang plans to continue through the summer for the first time. K4TFL has joined K4QER in adding a feminine touch to VSN. VFN and VN, of course, will continue daily year-round operation. CVO says he hadn't realized he'd been long absent from VFN until he was welcomed as a newcomer on checking in recently! Les has been operating aeromobile from Navy planes while junketing all over. K4QIX says K4MJZ's AREC group had a very successful S.E.T. drill. Norfolk Area mobilers are having regular Sunday morning transmitter hunts. PFC, at Quantico, has four operators batting out beaucoup traffic: K4VKE, K6RSQ, K8NVR and K9RLH. 9QN1/4 has moved to Cape Charles AFB, and reports he and 5OYB/4 are playing with 2 meters. K4ESB also is at the Cape Charles station. K4IKF announces the arrival of his first harmonic (a son) and loss of his beam and all-band dipole in a windstorm. JUJ won 4th call area honors in the YL-OM Contest for the fifth straight year. K4EZL resigned as ESN Manager. Our operatives tell us hot rods are competing for Doug's time! PVA has been checking into VN on mobile c.w. KX also is completing a little mobile rig. He has a modulator but it is primarily designed for c.w. MXU, now at Ft. Myer, furnishes much needed VN to VFN liaison. K4MSG plans to enter the

(Continued on page 128)

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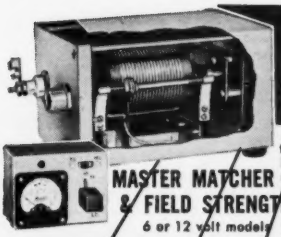

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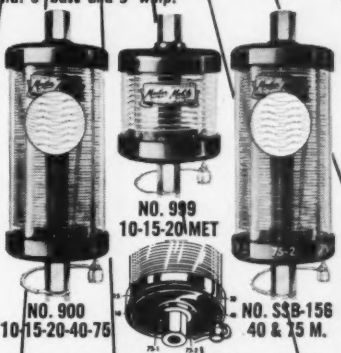

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96" WHIP

FOR 10, 11, 15, 20, 40, 80 METERS
SIZE 3/8" x 19"
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3 ELEMENT 11M. BEAM
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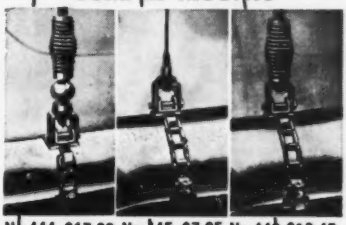

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Navy after his June graduation. K4RBQ reports he finally handled some traffic and may go into the business in earnest after high school lets out. Traffic: (Apr.) W4PFC 2109, K4AET 361, W4QDY 271, K4QIX 183, KNP 176, W4SNH 175, RHA 155, K4QES 136, W4MXU 133, SHJ 101, K4QER 61, QIY 47, W4OOL 42, BGP 33, K4IIP 28, W3MGL/4 17, W4ATQ 16, THM 10, K4MSG 8, W4WBC 5, AAD 4, JUJ 4, K4RBQ 4, W4PRO 2, W9QNI/4 2. (Mar.) K4QES 575, QER 95, W4IYR 50, K4IKF 34, W9QNI/4 2.

WEST VIRGINIA—SCM, Albert H. Hix, W8PQQ—Asst. SCM: Festus R. Greathouse, 8PZT. SEC: HZA. PAM: GAD. V.H.F. PAM: K8IYU. RMs: GBF, FNI, PBO and VYR. An effective traffic net now exists on 6 meters between Wheeling, Clarksburg, Charleston and Huntington. K8AIB has a new QTH at New Haven. K8IBB now has his General Class ticket. K8KTC is leaving for Navy service soon. K8HRO, KNC and FNI entered the last V.H.F. Contest. K8JHX has been in Florida for a few months. The 6-meter gang made a very good showing in Huntington in the last c.d. alert. K8LGT is a new ham at Red House. K8OAK is a new ham at Mineral Wells and K8KKU is new in Huntington. The SEC is interested in a further build-up in the AREC and RACES. Let's all get behind John and help him to provide a more efficient emergency communications system in this section. The following OOs did fine in the recent F.M.T.: K8EQF, K8JLF, K4CQA/8, GBF, SSA and TVO. K8CSG is the new EC for Kanawha Co. TVO is his assistant. Many West Virginia hams participated in OPAL, the civil defense test. K8AXU has finished a 220-Mc. rig running 10 watts. He will be at his portable QTH most of the time this summer. Your SCM's term of office expires Sept. 18 and he has decided not to accept another nomination. Traffic: K8JLF 366, KFK 171, CNB 74, W8HZA 51, BWK 45, NYH 38, K8GWV 16, CSG 6, IYU 4, AEN 3, BLR 3.

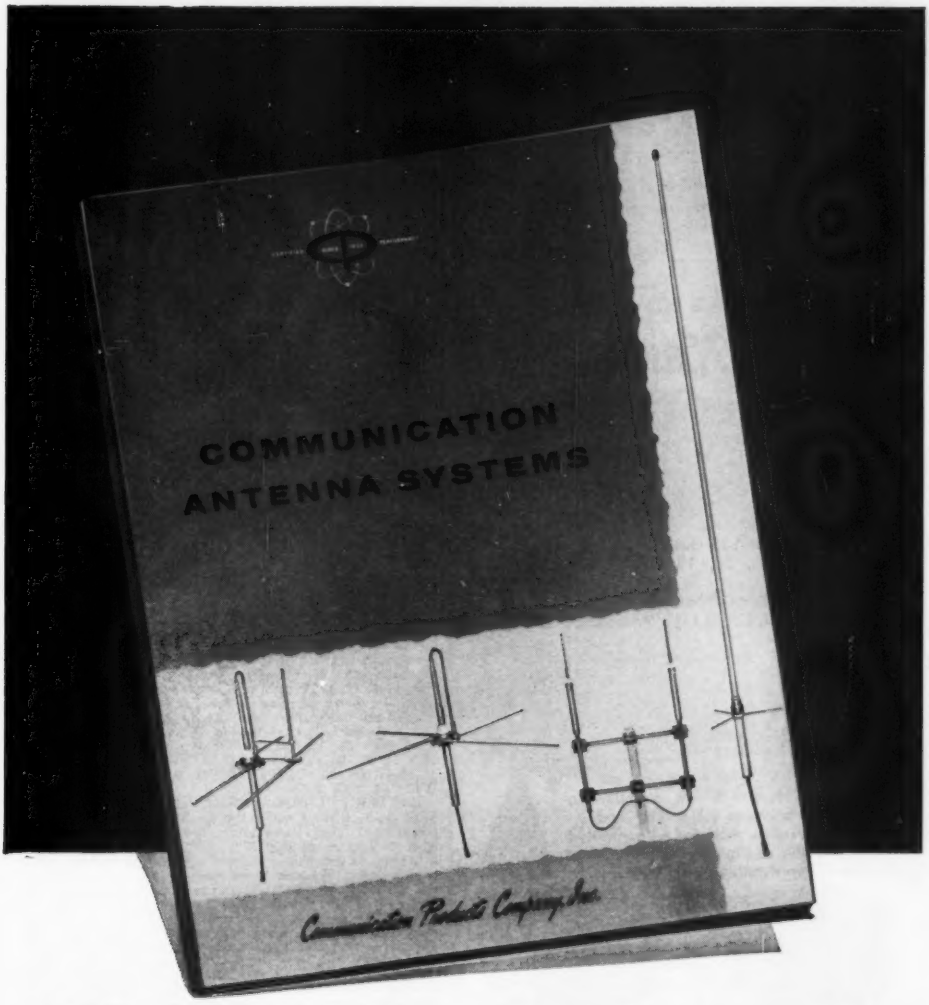
ROCKY MOUNTAIN DIVISION

COLORADO—SCM, Carl L. Smith, WØBWJ—SEC: NIT. PAMs: IJR and CXW. RM: WME and KØEDK. Thanks to DML for his work as SCM the past two years. KQD has resigned as RM to relax and ragchew. EDK is organizing a c.w. section net to be started early this fall. All c.w. operators, please contact him and advise speed, frequency, time and days desired for net operation. This is an opportunity for new operators to become familiar with traffic work. From OESs: CLJ reports the Denver 6-Meter Net meets Mon. at 2000 on 50.3 Mc. FKY has worked all 50 states on 6 meters, plus choice DX. FKY and CNM are experimenting with modulated oscillators on 220 Mc. TUT is a newly-appointed OO. Club news: The Yampa Valley RC is conducting Novice classes. *Splatter-Chatter* reports Operation Alert was a success, thanks to MMT, JSR, UPS, HRS, QAP, QAQ and 6DVB/Ø. The Pueblo ARA *Newsletter* says that AMR made DXCC with 113 confirmed. The Denver RC reminds everyone of the Colorado Centennial Hamfest to be held July 19 at the Kiwanas Picnic Grounds, 15 miles west on Highway 40. Register now for prizes and fun. RQF, RXJ and PGU dropped the "N" from their calls. Operators are needed for TWN. Contact WME if available. Traffic: (Apr.) WØKQD 312, KØDCW 180, EDH 175, EDK 140, WØWME 135, KØDXF 134, WØANA 108, DQN 79, ENA 51, KØEVG 48, WØQOT 28, KØLCZ 26, WØNIT 18, SIN 3. (Mar.) WØSLC 18.

UTAH—SCM, Thomas H. Miller, W7QWH—Asst. SCM: John H. Sampson, 7OCX. SEC: FSC. PAM: BBN. RM: JBV. V.H.F. PAM: SP. Effective Apr. 26, TWN moved to 7060 kc. and PAN moved to 7120 kc. for the summer months. TWN stays at 1900 MST, but PAN is changed to 2100 MST. Check into these nets whenever possible. The Beehive Net (Sun. 1230 MST, 7272 kc.) is getting good publicity in *PAN News*. ZKL has installed an 80-meter mobile. KN7HPC is a new Novice on 80 and 40 meters. EZM won the Kearns Road-e-o for driving skill. K7CDJ tried to get on the air after a two-week absence and found the floor of his shack covered with an inch of sand from a recent wind storm. DQW is putting the finishing touches on a kw. rig. VEL just got his license renewed (finally) and is back on the air. Traffic: W7JBV 364, OCX 158, QWH 10, ZWJ 9, BAJ 3.

NEW MEXICO—SCM, Allan S. Hargett, K5DAA—SEC: CIN. PAM: ZU. V.H.F. PAM: FPB. The NMEPN meets Sun. at 0730 and Tue. and Thurs. at 1800 on 3838 kc. The Breakfast Club meets Mon. through Sat. at 0700 on 3838 kc. TWN meets Mon. through Sat. at 1900 on 7060 kc. Try to meet these nets. In the 1959 Alert Farmington received free time on the local broadcast station, thanks to hard work by CIN. Many operators in New Mexico worked very hard to make this alert a success. My personal thanks to all of them. There isn't enough room to mention each one individually who helped make this OPAL 1959 a success. KKW and his

(Continued on page 130)



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XYL now are in Hawaii and working 40-meter c.w. The Alamogordo Radio Club, supported by the Tularosa Basin Two Meter Net, supplied communications and timing for the Fourth Annual Sports Car Hill Climb at Denny Hill near Weed, New Mex. K5RIT and K5MEP teamed together at the science fair in Albuquerque and won a slide rule apiece for their experiment. NXF is the first New Mexico station to win the Worked All Connecticut Award, presented by the Albuquerque Jaycees. Traffic: (Apr.) K5FHU 724, ECP 114, W5ZHN 54, K5DAB 46, GYZ 45, W5YSJ 37, K5GYA 27, W5NQG 24, K5ASE 14, W5HJ 12, CIN 11. K5DAA 8, W5GD 8. K5BWJ 4, W5VC 4, BQC 2, BZB 2, DMG 2, K5LWN 2, W5HJF 1, ZU 1. (Mar.) K5FHU 784.

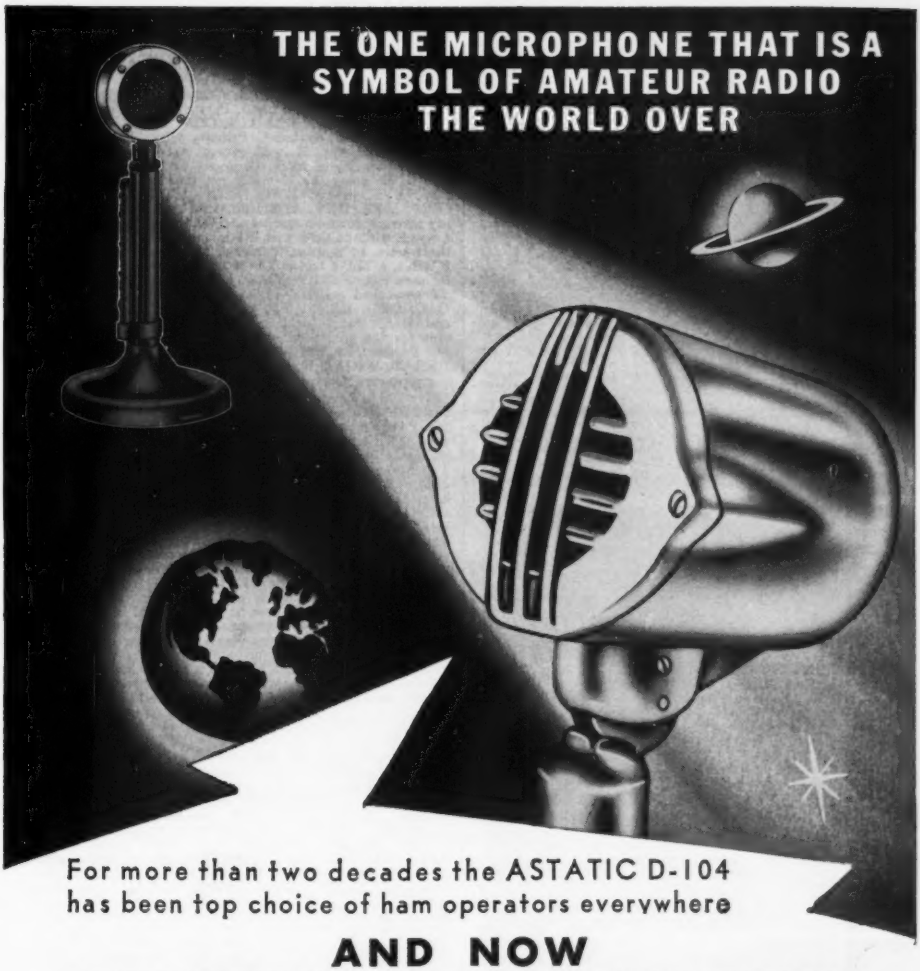
WYOMING—SCM, Lial D. Branson, W7AMU—SEC: CQL. The Pony Express Net meets Sun. at 0830 MST on 3920 kc.; Wyoming Jackalope Net Mon. through Fri. at 1200 MST on 7255 kc. for traffic. The YO Net is a c.w. net on Mon., Wed. and Fri. at 1830 MST on 3610 kc. While moving, BHH broke part of his antenna and is waiting for parts to repair it. AXG is in lots better shape after a trip to Billings Hospital. AEC is getting out of snow banks and says things are looking better now. The AREC has a fine membership under the supervision of the SEC and his ECs and soon will have all counties in Wyoming represented. DXV been snowed in all winter and is starting to get ready for Dudes. The South Fork Inn burned down so the Wyoming Hamfest will be held at the Caribou Lodge, 10 miles farther up the mountain, 28 miles south west of Buffalo, Wyo. Traffic: W7DXV 90, K6MDT/7 42, W7BHH 32, NMW 17, CQL 8, YXM 8, AMU 4, BKI 3, K7CMF 2, GEH 2, GDW 1.

SOUTHEASTERN DIVISION

ALABAMA—SCM, Clarke A. Simms, jr., W4HKK—SEC: WJX. PAMs: DGH and K4BTO. RM: RLG. Only 21 stations found time to send in a Form 1 card this month but they reported 1007 messages handled. I wonder what the total would have been had each of the 170 net members reported their traffic total. Welcome back to AENB, EVD, YNG and K4AJG. The Huntsville Emergency Net (AENS) held a training drill using only emergency power. This is worth consideration of all the Alabama emergency nets. AJG has a Navigator driving a Courier at 500 watts c.w. only. AENO is forming a training program for new members to indoctrinate them in proper net procedure and traffic handling. Our thanks go to the Montgomery and Birmingham Radio Clubs for sponsoring two very fine hamfests. Hope to see you at the North Alabama Hamfest at Huntsville in August. The State C.D. Director wishes to express his thanks to the individuals who participated in the test alert this year. They made the communications portion of the test very successful. Traffic: W4RLG 416, K4PFM 98, W4KIX 90, K4SSB 63, W4PVG 44, OKQ 43, K4JDA 41, W4MI 34, CIU 24, K4BTO 23, PHH 23, AOZ 20, RSB 19, SAV 17, W4HKK 16, CIN 15, WHW 9, K4KJD 4, JSP 3, W4ZSH 3, TOI 2.

EASTERN FLORIDA—SCM, John F. Porter, W4KGJ SEC: IYT. RM: K4SJH. PAMs: TAS and RMU. Don't forget that your Florida Emergency Net meets every Tue. on 3910 kc. at 1830 EST. K4LBX, the net manager, is trying to get things shaped up for the coming hurricane season. We hear there were 925 paid admissions at the Orlando Hamfest. The Lake ARA maintained a portable station at the Lake County Fair and Flower Show. Very good publicity was received. Last month we reported that Dot, UF, was elected president of the Floridoras but forgot to mention that Marge, K4RNS, was elected vice-pres.; and Margaret, K4LCD, secy.-treas. The South Miami RC now issues nice certificates to any amateur who works a certain number of their members. Details are in the May issue of *SKIP*. The club's rummage sale at Redlands went over big with a cash return of 80 dollars. New Novices in N. Miami are KN4FIE, FMA and FMB. WHK is the new trustee of NEK (the station with the house full of equipment). BWR has been reappointed Asst. Director. Hialeah: K4AHW reports that the new gear for Zone 3 c.d. has been installed and is ready for the hurricane season and any other emergency. FNR now has a total of 19 countries on 6 meters. New OPSs are K4LCD and ODS. A new ORS and OO is DQS. New ECs are K4JJZ, AHA and AYX. EXM writes from Washington that he soon will be settled in New Port Richey (retiring) and will be available for OBS and other activities. Art also has a Boehme keyer and will probably help out in giving some on-the-air code lessons. Don't forget to send in any news of Field Day along with pictures, if possible. Let's keep Florida in the news. Traffic: K4SJH 741, QLG 428, LCD 186, LCF 165, W4LMT 130, K4BNE 93, ILB 83, W4KGJ 76, K4RNS 68, BLM 62, W4IYT 58, K4COO 45, SLR 38, AHW 36, ODS 36, JJZ 35, VEJ 34, OSQ 32, W4DVR 29, K4BY 27, W4AZJ 20, DUG 17, K4MBB 17, VRU 14, OIE 10, W4BWR 8, K4MTP 7,. IWT 4, W4SJZ 4.

(Continued on page 132)



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WESTERN FLORIDA—SCM, Frank M. Butler, jr., W4RKH—SEC: PQW, RMs: AXP and BVE. Tallahassee: The TARC has been reactivated, with DKT, pres.; K4GXV, vice-pres.; and K4PVU, secy. Meetings are held the 1st Thurs. and 3rd Tue. of each month at 8 P.M. in the Lafayette Park Community Center. PVU is QRL with school and band. Port St. Joe: The monthly AREC drill was held with AIN, CCA, MXN, RJE, LQQ, RZF and RZM on hand. Panama City: The PCARC held a picnic Apr. 26, with several out-of-town visitors. Fort Walton/Eglin AFB: Okaloosa RACES took part in OPAL '59, using the 10-meter net frequency, with CMJ, BPJ, BVE, KMG, RWQ, RKH, UXW, UBR, AAK, 6EEF, MFY, HXV, ADM and OCG active. DQT, mobiling through town on the way to Orlando, was involved in a wreck while in QSO with RKH and 5HRY. Fortunately, there were no injuries. Pensacola: MS is now on with a KWS-1, a 75A-4 and a TA-33 beam. The NAS Club has its own call, K4NBF. Those who participated in OPAL '59 were IVD, FDL, PSB, SGB, DAO, UCY, PQW, QAC, BFD, KBQ, AXP, ZPN, DDD, SOI, QOJ, DOT and HIZ. Hams furnished communications and power unit for the sports car races in town. AXP is active in LO Parties. Traffic: K4PVU 69, W4BVE 43, K4OID 37, UBR 23, W4GAA 10.

GEORGIA—SCM, William F. Kennedy, W4CFJ—SEC: PMJ. PAMs: LXE and ACH. RM: DDY. GCEN meets on 3995 kc. at 1830 EST on Tue. and Thurs., 0800 Sun.; GSN, Mon. through Sun. at 1900 EST on 3595 kc. with DDY as NC; the 75-Meter Mobile Phone Net each Sun. at 1330 EST on 3995 kc. with MV as NC; the Atl. Ten-Meter Phone Net each Sun. at 2200 EST on 29.6 Mc., KWC as NC; GTAN, Sat. at 1000 EST on 7290 kc.; GPYL Net, Thurs. on 7260 kc. at 0900 EST, K4CYV as NC; GAN, 7105 kc. at 1800 EST Mon. through Fri., K4KZP as net mgr. K4CZR has now received No. 2 certificate for working all Georgia counties. Many others are nearing their 159th county. The Georgia Peaches have taken in all licensed YL hams in neighboring states as honorary members in the GPYL Club. The Peaches also will have a get-together at all hamfests in Georgia. Our SEC, Mel Rosser, has been in the hospital and each of us wish him a speedy recovery. The Confederate Signal Corps will have its Annual Hamfest on Aug. 15 and 16. We attended two wonderful hamfests in April, at Montgomery and Birmingham. K4VHC is now NCS Wed. night for the GSN. K4ETD, MARS Director for the Air Force, is back on the air after a long absence. K4KZP is a new member of Air Force MARS. FWH transmits Official Bulletins regularly on 50 and 144 Mc. Don't forget to renew your ARRL appointments. Traffic: K4ZMT 427, W4DDY 426, VHC 86, LVE 61, HJZ 27. PHA 26, VCM 17. HBI 2, KZP 2.

WEST INDIES—SCM, William Werner, KP4DJ—SEC: AAA. UPR Radio Club station FAE, with AAM at controls, was NCS of the P.R. Amateur Emergency Net on 7245 kc. during Civil Defense Alert. Stations reporting in were CK, HG, MC, RE, WT, ABD, ABX, ADY, AFL, AKH, FAE and KV4BA. KD received QSL cards from UL7KBA, HA5AM/ZA and VK3ARX/LH for 236 confirmed; he also worked KS4BB, Serrana Banks, and TI9CW, Cocos. KD is the first KP4 to make YLCC on phone, the first KP4 on c.w. in the YL-OM Contest and has cards for YLCC-150. DV is busy as director of communications for the C.A.P. BV is active on 10, 40 and 75 meters with his TBS-50. AMU measured frequencies in the ARRL F.M.T. to .0007 per cent. DJ added a 15-meter antenna. KD skeds W3EGI, ex-KP4AM, on 28 Mc. every Sat., W4DRV, ex-KP4JF, on 21 Mc. every Sun. and son K4PUJ on 21 Mc. Mon., Wed. and Fri. AAM and AMN are leaving for ROTC Air Force training in the States. WP4ALY bought an HRO-5, WP4AQK an HQ-110 and AIS an NC-303. AMG operated portable from St. Croix using a Viking 500. AFL ordered a Heath S.S.B. generator for his DX-100 and AEM a Heath S.S.B. generator for his Apache. DJ handled emergency traffic to Los Angeles at 2 A.M. because of a strike at Intl. Airport. KV4BA blew the plate transformer in the Globe King. AOC is a new net stationed in Manaubo. AET had antenna coupling trouble because of defective switch contacts in the Viking Ranger. MQ is preparing a Globe King for 40 meters. RD has KWM-1 mobile. HG has a new Mohawk receiver. DJ QSOed HI8GA, who says there are 15 licensed HI stations with six active. AIC is a doctor. The Banana Net meets at 12:30 P.M. daily on 7245 kc. Ex-KP4UT writes from Vietnam, Laos, that he now signs XW8AO on 10 meters and is on from 0800 to 1100 EST daily. All major towns of the Island are now represented on 6 meters, which provides continuous island-wide coverage across mountains where 10 meters never reached. ES and AAN have new Gonset 50s. GN uses a Gonset Communicator. CK has a 6-meter adaptor for the 20A. ABN, in Bayamon, is so located that he can contact all stations. Towns needed to make 100 per cent coverage on 6 meters are Mayaguez and Fajardo/Humacao. Antennas used range from folded dipoles to six-

(Continued on page 134)

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Size: 4⅜" x 3¼" x 1⅜" Wt.: 14 oz 12-V Input: **$57.50** 24-V Input: **$79.50**

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H SERIES

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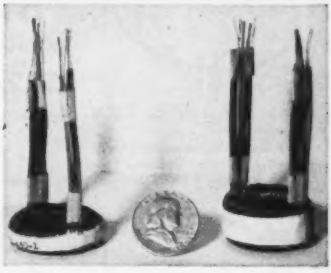
H-28-450-15 Input: 24/28-VDC. Output: 450-VAC center tapped...450 and 225-VDC from bridge rectifier...65 watts.

H-6-100-125-150-D Input: 6-VDC. Output: Voltage doubler configuration. Secondary tapped for either 100, 125 or 150-VAC. DC Output: 200, 250 or 300-V at 100 MA.

H-12-100-125-150-D Input: 12/14-VDC. Output: Voltage doubler configuration. Secondary tapped for either 100, 125 or 150-VAC. DC Output: 200, 250 or 300-V at 125 MA.

H-24-100-125-150-D Input: 24/28-VDC. Output: Voltage doubler configuration. Secondary tapped for either 100, 125 or 150-VAC. DC Output: 200, 250 or 300-V at 150 MA.



Without Encapsulation (2 ozs.). 1-10 units: **$16.00 ea.** With Encapsulation (3 ozs.). 1-10 units: **$18.50 ea.**

HD SERIES — 2000 CPS

HD-14-225-300-2-D Input: 12/14-VDC. Output: Voltage doubler configuration. Secondary tapped for either 225 or 300-VAC. DC Output: 450 or 600-V at 200 MA.

HD-28-225-300-2-D Input: 24/28-VDC. Output: Voltage doubler configuration. Secondary tapped for either 225 or 300-VAC. DC Output: 450 or 600-V at 200 MA.

Without Encapsulation (3½ ozs.). 1-10 units: **$18.50 ea.**
With Encapsulation (4½ ozs.). 1-10 units: **$21.50 ea.**

HDS SERIES — 2000 CPS

HDS-14-225-300-3-D Input: 12/14-VDC. Output: Voltage doubler configuration. Secondary tapped for either 225 or 300-VAC. DC Output: 450 or 600-V at 300 MA.

HDS-28-225-300-3-D Input: 24/28-VDC. Output: Voltage doubler configuration. Secondary tapped for either 225 or 300-VAC. DC Output: 450 or 600-V at 300 MA.

Without Encapsulation (3½ ozs.). 1-10 units: **$21.50 ea.**
With Encapsulation (4½ ozs.). 1-10 units: **$24.50 ea.**

400 CYCLE SERIES

14-115-1.5-400 Input: 12/14-VDC. Output: 115-V at 1.5 amp.

24-115-1.5-400 Input: 24/28-VDC. Output: 115-V at 1.5 amp.

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teen-element stacked arrays. ABW now reports to the Antilles Weather Net on 7245 kc. at 7 A.M. Traffic: KP4WT 87, RE 12, DJ 6, RD 2, AKH 1.

CANAL ZONE—SCM, Ralph E. Harvey, KZ5RV—WZ was host to HC, better known as W2ZXM/mm, Kurt Carlson, from the *Flying Enterprise II*, on his last trip through the big ditch. The Atlantic section of the Canal Zone section is becoming very active; has started an emergency net on 29.8 Mc., and holds net drills every Mon. at 2000 EST. All interested amateurs should come out and join the gang and get started in the Emergency Corps. The Crossroads Amateur Radio Association's new home is progressing very nicely. The Canal Zone Radio Association has been asked by a group of hams to poll the members of the Canal Zone amateur ranks as to their views on extending the limits of the 15- and 10-meter bands in the Canal Zone. All interested amateurs will be asked to submit their views either pro or con in the matter. By the time this is in print the SCM and his XYL, KZ5VR, will be vacationing in the States. They will be back on the Isthmus in September. Traffic: KZ5UR 99, OB 72, AD 59, WA 38, CC 22, CD 16, LC 16, VR 14, EL 6.

SOUTHWESTERN DIVISION

LOS ANGELES—SCM, Albert F. Hill, jr., W6JQB—SEC: W6LIP. RMs: W6BHG and K6HLR. PAMs: K6BWD and W6ORS. The following stations earned BPL in April: W6GYH, K6LVR, K6PZM, W6BHQ, K6HLR and K6OZJ. W6ZJB, W6GYH and K6LVR made BPL in March. W6BES is getting the "bugs" out of his KWS-1. K6GCC is learning the art of RTTY. K6PLW is doing a wonderful job on SCN and the net for the Eagle Scouts. K6LVR is plenty busy with traffic and now is taking NCS on PAN. K6TJG is building 4-65A linear and going s.s.b. W6AM grabbed IP1ZGY for a new country. K6GLS got three new ones with his WAKI Award. K6OJV got the new home-brew receiver going. K6MSG has a new two-element beam on 20 and a 2-transistor rig on 15 meters. WA6CTK is a new member of SCN. W6CIS vacationed in the East and visited Headquarters. K6TPL is working some fine DX and handling traffic on SCN. W6CK hit a fine average in the recent F.M.T. K6VGH reported fire QRRR while on a transmitter hunt! He has a new Gonset-28. K6EOK reports fine openings on 6 meters and he is getting a new HQ-170. K6OQD is collecting some fine wallpaper, LARK, CHIRP-tificate and GAYLARK Awards. A very fine Traffikers Breakfast was held in Los Angeles with a fine attendance. The next one will be held at the Southwestern Division Convention in Pasadena. SCN announces a full seven-day coverage, a good place to start your traffic on its way. Support your section nets: C.w., Southern California Net meeting at 1930 PDT daily on 3600 kc.; phone, the SoCal 6 Net on 50.4 Mc. at 1930 PDT daily. W6MEP is doing a bang-up job with repeater station K6MYP. K6SLM is building a home-brew oscilloscope. W6BUK reports MTN did a bang-up job during the emergency in San Felipe. He enjoyed operating K6USA, which is being manned by the various Los Angeles Area clubs. K6COP worked fine DX with TV "rabbit-ears" for an antenna! K6EXQ made 701 contacts in the YL/OM Contest. W6KAR will have RTTY on soon. K6YNB is sporting a new DSB rig. New officers of the Mira Costa High School Amateur Club are WV6DSG, pres.; W6UGU, vice-pres.; K6YNB, secy. K6JSD has been appointed NCS on ALN. K6DQA's father is now WV6EHJ, making 7 hams in the family! K6RIR reports new officers of the Lockheed Amateur Radio Club are W6BQW, pres.; Ken Apgar, vice-pres.; WV6BTD, secy. W6ZJB will be on RTTY soon. W6OYM and K6EOK report some fine 6-meter openings. New officers of the Citrus Belt Amateur Radio Club are K6GGS, pres.; K6KUF, vice-pres.; K6PJE, treas.; W6RPH, act. mgr. Traffic: (Apr.) W6GYH 1003, K6LVR 919, K6HLR 832, K6OZJ 537, WA6BAQ 329, W6BHG 304, K6PZM 220, K6JSD 139, K6OJV 102, K6TPL 94, K6GCC 87, K6OQD 71, K6PLW 70, W6USY 36, W6ORZ 27, W6CK 16, K6TJG 15, K2HNW/6 13, K6GLS 11, W6CMN 9, W6CIS 8, K6EOK 8, K6GKX 7, W6AM 2. (Mar.) K6MCA 1254, W6ZJB 1040, W6GYH 903, K6HLR 887, K6LVR 810, K6OZJ 455, W6BHG 142, WA6BAQ 135, K6PZM 129, K6JSD 117, K6OCC 88, K6OQD 84, K6OJV 68, W6KAR 63, K6EA 56, K6GKX 54, K6TPL 53, W6CMN 38, K6DQA 36, W6USY 33, K2HNW/6 22, K6EOK 21, K6GLS 21, W6CIS 8, K6PLW 8, K6TJG 8, W6BUK 6, W6SRE 3, K6VGH 1. (Feb.) K6MCA 1125, W6ZJB 876, K6OJV 87, W6KAR 43, W6CMN 31, W6NKR 24, K6TJG 6. (Jan.) K6MCA 1251.

ARIZONA—SCM, Cameron Allen, W7OIF—SEC: YWF. PAM, Copper State Net, 3880 kc.: FMZ. UVR has his mobile going again using 500-watt a.m., 2-kw. p.e.p. s.s.b. 1-kw. c.w., four vertical ¼-wave whips, center loaded, motor tuned, and three-element 3-band beam, 15-kw. power supply. The Arizona Amateur Radio Club of Phoenix went to Los Angeles on Apr. 11 and operated K6USA for a 24-hour shift. Those present were CAF,

(Continued on page 136)

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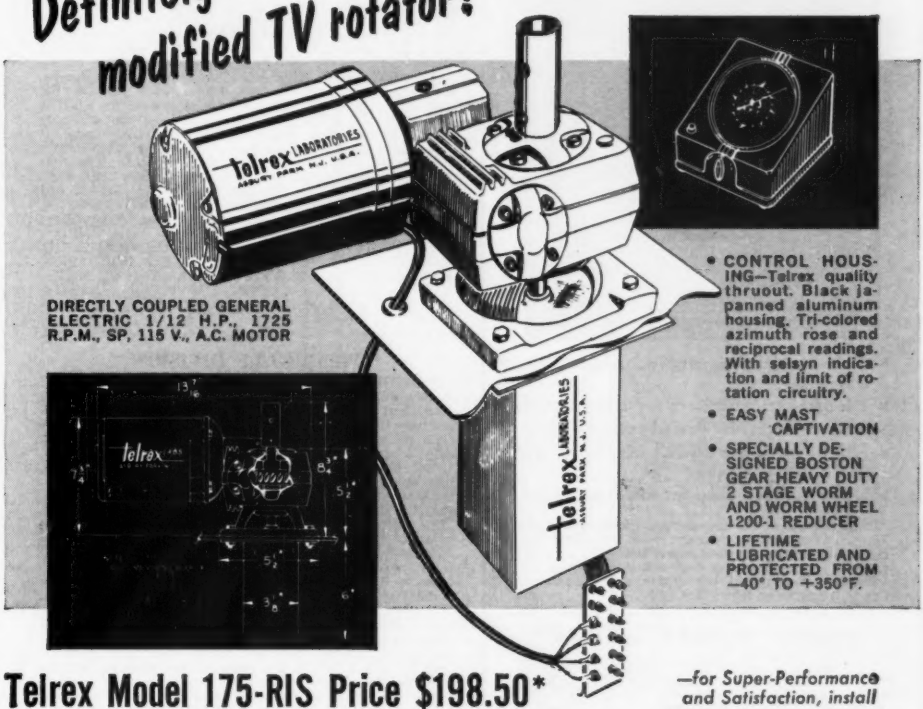

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FEW and his XYL, FMZ, OIF, RIJ and WYY. Everyone had a swell time. RIJ made color movies. Traffic: (Apr.) W7OIF 6, CAF 2. (Mar.) W7YAT 188, OIF 9.

SAN DIEGO—SCM, Don Stansifer, W6LRU—Nine stations in the section participated in the February F.M.T. Seven of the nine qualified as Class I Official Observers. They are K6ZCR, W6LRU, K6EC, W6HU, K6HAH, W6WNN, W6CDF, K6IPV and W6BKZ. Three of the first five are from Orange County and K6ZCR, the only YL to enter, had the best error, 13.8 parts per million average on five measurements. W6TNS, well-known magazine writer about electronic topics, was the guest speaker at the May meeting of the Helix Amateur Radio Club. He showed a number of new transistorized transmitters and other devices recently built. W6WLQ is now active on 20-meter phone from San Diego with an 813 final. W6BZE vacationed in Chicago in May. W6EOT and W6YDK continue to make BPL every month. The May meeting of the San Diego DX Club was held at the home of the president of the club, W6CAE. K6DAM is now a member of the Helix Club. WA6CDD writes that the El Cajon Valley High School has an amateur radio club using a DX-100, an AF-67 and an SX-96. The SCM invites all individuals and clubs to send in news for this column prior to the seventh of each month. This is especially true during the summer months. Traffic: W6YDK 1568, W6EOT 775, K6ZCR 152, W7YKN/6 26.

SANTA BARBARA—SCM, Robert A. Hemke, K6CVR—The Santa Barbara Radio Club had an FB demonstration of the city's telephone system by K6ODE and W6MWX, including a working model of an automatic dialing system. Jim Culbertson, formerly commander at KJ6BV, is back in Santa Barbara awaiting his W6 call. Bill Darby just received his call, WA6EZE. The first Fishy Hamfest of the year was held at Tehachapi Park the week end of Apr. 12. The portable rig, DX-40 and HQ-110, was operated under the calls W6RQV, K6MLV, and K6RWP. The generator was supplied by the Kern County Sheriff's Dept. Those present were W6RQV, W6NXT, W6VZG, K6JRT, K6VSE, K6SWR, K6MLU, K6GHT, K6CVR, K6DMC, K6LWG, K6MHO, K6PKE, K6DBQ, K6YKU, K6QXB, K6TZT, K6TZR, K6IES, K6LAF, K6RWP, WA6BWC, WV6EOQ, KN6RDT, KN6RZM and KN6SGT. A new call in Paso Robles is WV6FAX. W6OUL operated K6USA on 2 meters and reported having a ball. Traffic: W6OUL 5, W6FYW 4.

WEST GULF DIVISION

NORTHERN TEXAS—SCM, L. L. Harbin, W5BNG —Asst. SCM: E. C. Pool, 5NFO. SEC: K5AEX. PAMs: BOO and IWQ. RM: ACK. I had the pleasure of attending the annual swapfest in Abilene May 3. More than 400 were present. The Mayor of Abilene proclaimed May 3 as Amateur Day and sent a representive to welcome us to Abilene. NW, our first vice-president, gave a fine talk on the progress of the League. K5AEX conducted a meeting explaining the part of AREC in RACES and civil defense. Mr. Glen Meeks, Civil Defense Director for Taylor Co., promised his support to the amateur in the RACES program. AAO was awarded the Abilene Service Award for his untiring efforts in assisting would-be hams in the area. CZY and EZZ have moved back to Brownfield. K5IDZ became the proud father of a baby girl. K5PXV has bought a home in Richardson. The Wichita County AREC provided communication for c.d. during NOPAL 1959. Direct communication was established with State Headquarters in Austin. Participating AREC members were IFI, MQW, PZS, SYL, K5IPG, K5KYC and K5RGC. The planning was good but equipment failure and lack of operators made it pretty grim at times. Be prepared, we never know when an emergency will strike. KYM has been appointed C.D. Coordinator for Ochiltree County. KYN and LYF are back on the air with new rigs. IAI moved to Gladwater and is on mobile. A word of caution: Please don't test your rig on the air without signing your call. Traffic: W5SMK 553, K5IDZ 263, W5UTW 195, BKH 180, K5IPG 167, LZA 136, HGL 97, W5GY 76, JSN 50, K5IBB 34, ACD 29, JZK 17, W5DYU 14, K5SQY 14, ACD 12, W5OCV 10, BTH 6.

OKLAHOMA—SCM, Richard L. Hawkins, W5FEC —SEC: K5KFS. RMs: JXM, K5JGZ and VVQ. PAMs: DRZ, MFX and VCJ. K5INC renewed his OPS appointment. EHC is enjoying a new GSB-100 S.S.B. transmitter. NPQ uses an indoor antenna but gets out well. K5CAY is looking for an Oklahoma City station on 2 meters. The Bartlesville Club finished its code and theory classes with 18 Novice exams sent to the FCC. KN5UKC is a new Novice in Copan. RRM is within whispering distance of DXCC and awaits each day's mail eagerly. PAA is having antenna trouble. K5JTG has added a grounded grid to his Apache. New officers of the Oil Capital Mobile Club are ZBI, pres.; ZBD, vice-pres.; DFQ, rec. secy.; TVG, secy.; FLW, treas. BNQ won 2nd place in the YL/OM Contest. Her OM, IWL, won 1st place in the Oklahoma section in the Phone SS. K5DUJ is trying out a new home-brew elec-

(Continued on page 138)

HARVEY RADIO HAS COMPLETE LINE OF antenna specialists Citizen Band ANTENNAS

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M-22 Ground Plane Antenna is non-directional, fits 1¼" O.D. tubing. Removable vertical and radials are chrome plated brass telescoping tubing. Cadmium plated steel mounting bracket and "U" bolt hardware. Base accepts PL-259 connector . . . **$15.95**

ASP-63 Base Loaded Portable Whip for portable transmitters and receivers. Vinyl covered loading coil wound into whip. 40" long. Has PL-259 connector **$7.77**

ASP-58 Portable Radio Antenna Rod. All stainless steel. 43" long. Base has 10-32 thread **$6.90**

M-12 Ground Plane Antenna is non-directional, fits 1¼" I.P.S. pipe. Will handle up to 3 K.W. S.S. removable rods. Waterproof. Base accepts PL-259 connector . . . **$42.21**

M-24 Rear Bumper Mounting Antenna. Mounts easily on any car bumper. Insulated receptacle accepts cadmium plated spring. 102" S.S. whip. 15' of RG-58/U cable with PL-259 connector on one end and solder lugs on other. Whip gutter clip included . . . **$17.60**

ASP-189 Front Cowl Mounting Antenna. Vinyl covered loading coil wound into S.S. rod which fits into rocker support. Mounts from outside car in ⅞" to 1" hole. Has 6' of RG-58/U cable with PL-259 connectors on both ends **$15.75**

M-23 Mobile Rear Mounting Antenna. 102" S.S. whip, plated spring, aluminum swivel base with coax adaptor and 15' of RG-58/U cable with PL-259 connectors on both ends. Whip gutter clip included . . . **$18.90**

ASP-185 Auto Gutter Clamp Antenna quickly snaps on gutter of car. Vinyl covered loading coil wound into whip. 40" long. Complete with 12' of RG-58/U cable and PL-259 adapter . . . **$15.40**

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tronic bug. K5IBZ put time sequence keying in the DX-100. Your SCM had a good visit with PML, who has now been stationed in Arizona since May 1. Oklahoma's Ham of the Month is AZO for his fine work with the Oklahoma WX Net. Traffic: (Apr.) K5MBK 236, USA 214, CAY 154, W5DRZ 119, VVQ 106, K5JGZ 49, W5PNG 36, K5JTW 32, MFK 32, W5FEC 28, MGK 27, K5OCZ 26, INC 23, ELG 21, W5GOL 18, K5MZM 16, W5WAF 14, WAF 5, K5CBA 11, W5EHC 7, K5BNQ 6, W5IWL 3. (Mar.) K5KBQ 128, ETM 104.

SOUTHERN TEXAS—SCM, Roy K. Eggleston, W5QEM—SEC: QKF. PAM: ZIN. RM: K5BSZ. QKF and QEM visited the Harlingen Amateur Radio Club. K5LZD has a new rig with a pair of 813s. We are glad to hear that HBM, ex-VQ1RF, is back on the air. The members of the Corpus Christi Amateur Radio Club furnished communications for the assembly and line of march for the Buccaneers Day Parade. K5DQN is building an s.s.b. exciter. K5MFS is working DX with a new 15-meter beam. K5EHY has a rotatable dipole 50 ft. high for 15 meters. We are sorry to report IPE and K8W, two of the old-timers in Southern Texas, as Silent Keys. They will be missed from the ranks of the amateurs. Southern Texas is sorry to lose K5OEA and SPD to Maryland. We will be looking for you back in Texas soon. EGD transmitted ARRL Official Bulletins during April. MVL is in the midst of a rebuilding campaign. ZN is building a 300-watt transmitter. K5SBT has dropped the "N" from his call. QLT has an FB set-up through AREC at Port Aransas. QKF and RPH attended the Dental Convention in San Antonio. QEM and QKF visited the Alamo Heights High School Radio Club. In the absence of ETA, QEM presented the club with its ARRL Charter. Traffic: (Apr.) W5EGD 252, K5RYS 146, W5ZIN 86, K5OEA 84, SPD 68, W5HKE 35, DYV 18, KBS 16, BHO 10, K5MYY 6, LZD 3, W5QLT 2. (Mar.) W5EGD 287, K5PEQ 110, MWH 105, W5BHO 14.

CANADIAN DIVISION

MARITIME—SCM, D. E. Weeks, VE1WB—Asst. SCMs: A. D. Solomon, VE1OC, and H. C. Hillyard, VO1CZ. SEC: BL. New appointments include OZ as EC, IM as OPS and ØNI as ORS. Winner of the VE1 Contest was VN with 5238 points. Runners up were MA and ABJ. Top scorer in the Goose Bay QSO Party was VO2RC, followed by 2NA and 2RH. Civil defense officials commended the many Maritime amateurs who assisted in the recent C.D. Exercise. OQ now has a new home-built all-band transmitter with 150 watts. Have you worked Newfoundland's First Amateur? He is Ernie Ash, VO1AA, VO1 QSL Manager. Ernie received his first license in 1922! In v.h.f. activities, CL has worked 2 states on 2 meters. Interested persons are reminded that the address of the new Canadian publication is *The Canadian Amateur*, 10328 Trans-Canada Highway, North Surrey, B. C. Why not make a written summary of your Field Day efforts, etc., and include this in your club minutes so that it may be referred to when 'tis time to make plans for next year. See you in Halifax at the Convention? Traffic: VE1VN 44, VO2NA 7, VE1IM 4, ES 2.

ONTARIO—SCM, Richard W. Roberts, VE3NG—No less than fifty-four mobiles are on regularly in Ontario and more are expected. Six maritime mobiles are active already on our lakes. The Ontario Amateur Radio Assn. is being organized. The London ARC members were guests of the Guelph Club and met in that City. The Northshore RC held a wonderful Annual Dinner at Bowmanville. The guest speaker was your SCM. DUU smashed his big toe. BWK is going to VE6-Land soon. DVM and ARF vacationed in Florida. AKC was host to 14 other hams at his summer cottage at Woodland Beach. The occasion was a meeting of the Beer & Chowder Club. (Local 88 that is). DTO is back from VE6-Land. DUG visited Newfie. We welcome Tom Harding, DRF, to ham radio. EC DSM, of Toronto, has 25 mobiles on call for Emergency Corps service. KM, our SEC, visited the Kingston Club. The thanks of the Ontario hams goes to the staff of *The Canadian Amateur* for the fine effort on the VE3 edition. RW had the flu bug. Bootleggers on our airwaves have been apprehended in the Belleville and Toronto Areas. AML visited Ottawa, Peterboro, Belleville and Toronto. The Quinte ARC visited the Kingston gang. The Windsor ARC now is affiliated with ARRL. CTP is a newcomer to our hobby. AFZ is on 10 meters. BVJ and BXQ, from Gearldton, visited BSA. The North Bay Hamfest will be in session the same week end as Field Day. (Fri., Sat. and Sun.) The Scarboro Club elected the following: DDP, pres.; EMX, vice-pres.; BYF, secy.; Sid Prior, treas. The club's spring dinner was a success. We will miss two well-known friends, DMX and ANY, now Silent Keys. Traffic: VE3DPO 118, NG 118, NO 94, BUR 80, BJV 47, BZB 44, CFR 43, CLF 32, DH 32, AML 31, DWN 21, KM 16, CO 13, DIO 12, DUU 11, RW 8, DLC 7, OE 7.

QUEBEC—SCM, C. W. Skarstedt, VE2DR—As this is written various groups are making plans for the big

(Continued on page 140)

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Collins 312B-2 control console	150.00
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event of the summer, Field Day. We are now in the "doldrums" as far as news is concerned, and your cooperation will be most welcome. ZL1AV is expected to visit Montreal in July. WT, at Joliette, is now an ORS, and OJ may receive his appointment shortly. BAA is busy building a 100-watt rig. BAW is the club station at Sir George William's College. ATL extends thanks to AGN, AWV and ABE for their fine assistance with code and theory classes, organized by Le Club des Jeunes Operateurs. As a result ED, BAZ, BBJ and BBR now have their tickets. Thanks to VE2CQ, the sugar party which was run by Le Radio Club de Quebec was a success, and every ham present will remember a pleasant outing. Recent newcomes are AWF, AVD, BBS and ANV and on the distaff side, EF. To you all, a hearty welcome. HN's son Andy is an ardent s.w.l. and has many exotic cards on display. APA likes 75-meter phone on Sun. AIM and ZG returned to the fold after many years in inactivity. AUH, ANK, AUM, UF, AJT and ATB, of Trois Rivieres, meet and carry out interesting laboratory experiments. ADE has been appointed AEC. He is active on the Quebec Fone Nt and teaches code to 5 SWLs in Sherbrooke. Traffic: VE2DR 108, WT 38, ADE 35, EC 30.

ALBERTA—SCM, Gordon W. Hollingshead, VE6VM—Make your plans now to attend the Provincial Hamfest to be held in Calgary Aug. 1 and 2. This is a "must." MJ is reported busy instructing a c.d. class in communications. OD has tendered his resignation as net control for the APN after a job superbly done. YE and his XYL, together with their station recently were featured in the local paper. George has been getting his share of DX as well as doing a fine job of handling local traffic. VE6s have now gone into three letter calls. Traffic: VE6HM 101, YE 49, OD 15, TG 11, TT 10, PV 4, SS 3, BA 2.

MANITOBA—SCM, James A. Elliott, VE4IF—Spring has brought out the mobiles in force. Heard on 75-meter phone were WS, CX, NO, HL, HC, BG, GG, GC, PE, IF, LF, PU, AR, TE, GK, KP, KG, JQ, AU, KN, MP, MJ, UR and 3ASL at Fort William. VJ is now on s.s.b. Fred Dickson, ex-FD, was a visitor to Winnipeg. He is quite proud of his VE6 license plates. JW has completed plans for Field Day. AI has a new Apache. UR has a Comanche and a Cheyenne mobile. XP is back on with a new rig. Bris and Ethel, BR and CB, have acquired camping and fishing equipment and will be hitting the road with five jr. operators. TJ is back from a holiday in the South. Welcome back to AY, who has been waiting for snow to disappear so he can get to his shack. XJ is the proud owner of a 75A-4. GC is moving to VE8-Land. WS and his XYL recently returned from ZL-and VK-Land. LC, our QSL Manager, has returned from a visit to England. Traffic: VE4AI 24, XP 5, AN 4, EG 4, JW 4, PA 4, RB 4, TE 4, NW 3, MJ 2, MM 2, WS 2.**

An 800-Watt Linear

(Continued from page 13)

mistuning with high g_m tubes can easily result in excessive screen dissipation.

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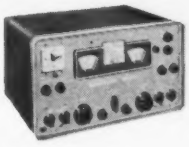

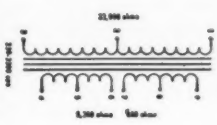

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Same as used in W2EWL SSB Rig — March '56 QST. 3 sets of C.T. windings for a combination of impedances: 600 ohms, 5200 ohms, 22,000 ohms. (By using the centertaps the impedances are quartered). The ideal transformer for a SSB transmitter. Other uses: interstage, transistor, line to grid or plate, high impedance chcke, etc. Size only 2" h. x ¾" w. x ¾" d. Brand new. Fully shielded. At fraction of Government cost.

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Control Circuits

(*Continued from page 15*)

15 turns, ¾-inch diameter.

This voice-controlled system has also been used very satisfactorily on a.m. I often wonder why voice control is not used more on a.m., as it increases the operating pleasure a great deal. One of the big advantages of s.s.b.-type operation is that VOX is customarily used. This need not be limited only to s.s.b.

The latest change in the circuit of this article occurred when a 0-100 microammeter was placed in series with the bottom end of the 24G t.r. tube grid leak. This meter then read 24G grid current and worked very well as a plate tuning meter for the final. Grid current ran about 100 microamperes for a kw. input to the amplifier. I found that the grid leak had to be a low-capacity type or it would burn up. The successful resistor was a 5-megohm deposited-carbon high-voltage type. QST

Ferroelectric Capacitors

(*Continued from page 36*)

The d.c. bias on the ferroelectric capacitor was varied 40 volts either side of the 150-volt bias level and the deviation noted. Two sample curves are shown in Fig 6. Fig. 6A demonstrates the deviation where the fundamental and operating frequencies are the same, in this case 7.2 Mc. Fig. 6B shows the deviation at the fourth harmonic of the fundamental frequency, or 28.8 Mc. Note that the modulation index in the two ranges is almost identical and that the modulator is linear over the entire range. The deviation is within allowable limits on all bands from 3.5 through 30 Mc.

The temperature stabilities of the v.f.o. with and without the ferroelectrics in the circuit are compared in Fig. 7. The degradation of the v.f.o. close to its normal operating temperature (39 degrees C.) as seen from the curve is not serious. Neither thermostating techniques nor additional temperature-compensating capacitors were used in the modification. If increased temperature stability is a requirement, either of the above ideas could easily be incorporated.

Summary

The use of ferroelectric capacitors as the modulating elements in a narrow-band f.m. system has proved to be quite useful in the h.f., v.h.f., and u.h.f. regions where conventional reactance tube and phase-modulation methods are unwieldy. The chief advantage of narrow-band f.m.

(*Continued on page 144*)

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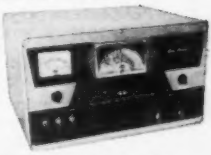

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is that it reduces or eliminates certain types of interference to broadcast reception and is quite simple and inexpensive to construct using capacity-modulation techniques. Detection of n.f.m. on a typical a.m. receiver is quite easily accomplished by means of slope detection; i.e., by moving off frequency slightly.

Use of this type v.f.o. in portable and mobile operation where equipment must be restricted in size should prove very helpful.

Acknowledgment

The authors wish to express their appreciation to Mr. Craig Rockafellow, W8QBX, for his assistance in constructing and testing these units.

QST

How's DX?

(*Continued from page 75*)

Hotel. "Nearly 100 DX men from the Northwest were able to attend last year's Seattle affair. This year, with the Portland site some 400 miles closer to California, we expect representatives from the W6/K6 groups." . . . . . Don't forget the DX Breakfast slated for the 26th of this month at the ARRL Southwestern Division Convention in Pasadena. K6CYO stands by for inquiries . . . . . K3BVV, W8CSK and CO2US disclose that KZ5LP, VP9EP and CO2QH are K9OTI, W4GMM and ex-K4MDY, respectively . . . . . On, *on* to St. Pierre! W5ERY hears that VO1BD will honeymoon there as FP8AY during the first week of August; K2s TBU and UYG aim for September FP8 activation; K4s BFA and RSD anticipate multiband DX doings there soon; and K2JGG expects to have FP8AB rollin' right about now . . . . . Our county-collectors may be interested in W4FOC's discovery of K4LEM, the only c.w. man in Georgia's Screven Co. And W8KX says, "Those working toward the Michigan counties award and having difficulty spotting demarcations on ordinary maps can obtain a county outline map from me for five cents postage or s.a.s.e. It shows no towns but combines well with a Michigan roads map." . . . . . W5KFN would appreciate current QTH data on KG1FA and KX6BU, both worked in 1956 . . . . . W3ICQ, who nabs a goodly share of DX, was surprised to see her photo in Japan's *CQ*. Elsie is dying to know what they say about her in the accompanying text. It's all Greek — or rather, Japanese — to her . . . . . UM8 confirmation would net KP4KD a Russian sweep except for stubborn Wrangel. "Just applied for my YLCC-150 sticker, so the gals still fall for grandpop's line, at least on the ham bands!" . . . . . On the first or second week end of next month W7s ABO BKI DTD, K7s AHO CMF and CRL will head for the hills to put Big Horn Mountain, Wyoming, on 80 through 6 meters, c.w. and phone. Wyoming-hungry WAS-hunters take note . . . . . For your WAVE pleasure W3VDV/8 suggests Prince Eddie Island's VE1ADR around 14,110 kc. at 0400 GMT, of leisurely c.w. pace . . . . . W6KG observes W1IJD keeping cool this summer as KG1FN on T-3, Fletcher's Ice Island . . . . . NNRC has it that HR1JH is due for return to Amarillo about now. Also, regarding our April mention (p. 154), Tom Kneitel of *Popular Electronics* reports "WPE" s.w.l. call-sign registration applications arriving at the rate of 150 per day — just in case you've heard that the strictly-listening avocation is anything but booming.

Ten Years Ago in "How's DX?" — QSLs and QSLing procedures are the subject of your July, 1949, column prelude. In this connection Jeeves fashions a tear-drenched *lettre de cache* . . . . . On the summer DX front lines 80 succumbs to rising atmospherics despite JA2AT's efforts to stir up W1, W2 and W3 customers to clinch a U.S. call-area sweep . . . . . Forty is quiescent save for EZ1MS, JA2BT, KP6AE, UAØFP, VS2BX and sundry lesser lights . . . . . Twenty c.w.'s big guns fire massive r.f. salvos toward AC4s

(*Continued on page 146*)

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73. Bill Harrison, W2AVA,

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More Hamfest Calendar

(*Continued from page 58*)

Tennessee — The Frye ARC will hold its third annual Chattanooga Choo Choo hamfest on Aug. 1–2. There will be a banquet Saturday night, while Sunday activities will be at the Warner Park Field House. Further information is available from Joyce H. Lawson, K4QNI, 855 North Chamberlain Ave., Chattanooga 6.

West Virginia — The Blennerhassett ARC will hold its annual picnic at the City Park in Parkersburg on July 26. There will be, among other things, a transmitter hunt. 50.1 and 3890 will be monitored. Get further details from Charles R. Helmick, 2511 Oak St., Parkersburg.

Wisconsin — The Northland hamfest under the sponsorship of the Northland ARC will be held at Bayfield on July 11, and will be followed by the annual Wisconsin Badger Emergency Net (BEN) picnic on Sunday, July 12. Excursions to beautiful historic Madeline Island will be available both days. Entertainment. For more details, contact Walter Sahm, W9HHJ, Ashland.

Wyoming — The annual Wyoming hamfest will be held at the Caribou Recreational area in the Big Horn mountains, 28 miles west of Buffalo, Wyoming, on U. S. Highway #16, sponsored by the Sheridan Radio Amateur League. Cabins or camping available in the area. A full program consisting of a banquet, contests, and transmitter hunts. Registration, including the banquet, is $5.00. Register with Robert B. Miller, W7QPP, 362 E. Loucks St., Sheridan.

Strays

From the Montreal Amateur Radio Club, sponsors of the 1958 VE/W Contest, comes word that the top score of 132,468 points was run up by VE2NI operating VE3UOT. As in the past, *QST* will carry score tabulations and identify all certificate winners when MARC's contest committee completes the checking, now in its final stages. VE2BB advises that this year's U.S.–Canada to-do is scheduled for September 26 and 27.

—·—

In the caption identifying the two Novice winners in the 1958 Sweepstakes (May *QST*), it should have been pointed out that both were General Class licensees when the photos were taken. Our correspondence has demonstrated that there are a heck of a lot of eagle-eyed *QST* readers who scrutinized those photos very carefully.

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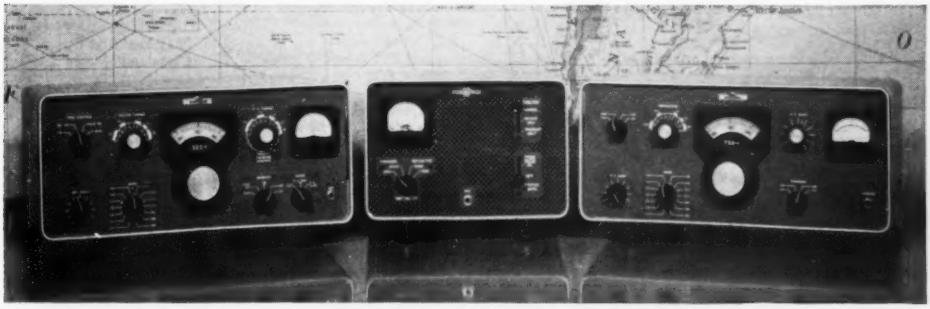

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Correspondence

(Continued from page 83)

practice text about 1 kc. from your sending frequency and lagged your sending by perhaps a second or so. He evidently was doing this for the benefit of those who were trying to copy the 5 w.p.m. text and might have missed a character here and there. He did stop after about half the 5 w.p.m. text had been sent and then began swishing his v.f.o. across your frequency. This, I presume, was done so that those who were trying to copy would become used to interference.

Thank heaven, there are a minimum of such Schnooks engaged in amateur radio, for it is just this sort of thing that makes those of us who try to abide by the amateur's code and the rules of the FCC retch with disgust. May he forever have QRM-free solid QSOs.

In closing, I would like to say to those who were trying to copy that text in order that they might get their Novice license, ham radio isn't really filled with that type of person and I would like to apologize for the rest of us and sincerely hope that this sort of thing doesn't occur again.

— *H. W. Eppes, KN3GZK*

MEMBERSHIP

1183 Farmington Avenue,
West Hartford, Connecticut

Editor, *QST:*

I am ashamed to see that W7PJA should not renew his membership to the League because of "too many s.s.b. articles in *QST*."

Without the League there would probably not be such a thing as amateur radio. I feel that anyone who is not a member is getting a free ride. We have to support the League in order that it might represent the ham fraternity in matters concerning our hobby.

Although I am a c.w. op. I do not think that there are too many s.s.b. articles in *QST*. We are not paying $5.00 for the magazine, *QST*, but we are paying it for insurance, you might say, If the League won't or can't represent us because of funds, who is going to?

All I can say is that the League is doing a splendid job, and I hope it can keep it up.

— *Paul Boynton, K1GWS*

3611 East 81st Street,
Cleveland 5, Ohio

Editor, *QST:*

W7PJA's cancellation was not needed, I'm sure. If he does not send in the dues, his mail box will not be stuffed with a magazine he does not care for. I hope he suffers a little with curiosity to glance through it before he throws it out with the rest of the trash. Mr. Strong, would you pay five dollars a year to enjoy our hobby? That's just about what it amounts to. ARRL has been the principal source to argue our views, backed up by a body of fellows who are willing to pay for necessary representation. Of course I know the majority have gone along for the ride. They share alike, which perhaps is the way it should be, but it makes you think, doesn't it?

As a parting thought you might be interested to know that the military is not planning to go s.s.b. just to spend more of your tax dollars, friend. No sir, they have realized what hams have already found out.

Join ARRL — don't just subscribe to *QST*!

— *Dave Blosser, W8MDL*

GOOD FIHTH

9 Bennett Street,
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Editor, *QST:*

What is all this chatter about poor operating by some of our Novice friends?

For over thirty years now I have been trying to improve my fist and about the nicest of compliments is, "You sure have a nice fist." So what happens? I find I have learned the wrong code or all of this time I have been sending it improperly. The dots should be about three times as fast and an "H," for instance, should be 7 or 8 dots, not the four I have learned. This comes from a few of the boys who have graduated and can use an electronic keyer.

(Continued on page 150)

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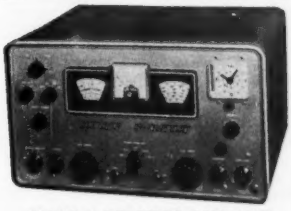

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I have zeroed some of them and requested that they clean up their fists. They sound more like lids than most of our new Novices but they just laugh and keep right on jamming up the air.

— *Duane Harris, K2PFC*

RST

Box 485, Linfield College,
McMinnville, Oregon

Editor, *QST:*

Nothing seems quite so ridiculous as the present controversy about signal reports. There are only three real reporting points: (a) difficult copy, (b) normal, and (c) remarkably clear copy. If something is poor in the quality of the signal, e.g. QRI, it is mentioned separately. Any system, no matter how elaborate or simple, could tell more or less than these three points. The confusion over RST is nothing compared to that which would be initiated by the process of a change.

— *Ed G. Dolan, K7AAW*

Happenings

(*Continued from page 54*)

proximately 8 × 12 inches) for posting in amateur radio stations the "Code of Ethics", now printed in the front of the *Handbook*. That these be distributed at a nominal cost. But there was no second, so the motion was LOST.

22) Moved, by Mr. Crossley, to refer to the Planning Committee for investigation the value to the League of Incorporation under Act of Congress. Also investigate the possibility of success. But there was no second, so the motion was LOST.

23) Moved, by Mr. Crossley, that the General Manager keep the directors informed in his Directors' Letters of the coming and/or former visits to clubs, conferences, etc., of all Headquarters personnel. This to include the purpose of the visits, organization or person visited, who made the visit and pertinent results or accomplishments, if any. But there was no second, so the motion was LOST.

24) Moved, by Mr. Crossley, that the League through its General Manager take the necessary action with OCDM and FCC and/or any other proper agencies to have RACES established as a continuing and permanent communications service by the radio amateur, so long as Civil-Defense agencies are considered important by the Federal Government. After discussion, moved by Mr. Roberts that the matter be laid on the table; but there was no second, so the motion to the table was LOST. Whereupon, with the consent of his second, Mr. Crossley withdrew the motion.

25) The Board recessed for luncheon at 12:13 P.M., reconvening at 1:44 P.M., with all directors and other persons herein-before-mentioned in attendance.

26) On motion of Mr. Crossley, unanimously VOTED that the written reports of all Board committees to the Board be made a part of the Minutes, or an appendix to the Minutes and shall be so published.

27) Moved, by Mr. Crossley, that whenever possible, in future League booklets or publications where a phonetic alphabet is published, the ICAO phonetic alphabet be included. (This is not to be considered as an attempt to force the use of these phonetics.) But there was no second, so the motion was LOST.

28) Moved, by Mr. Crossley, that the General Manager investigate the possibility of an amateur liaison with certain Government Agencies, such as the Atomic Energy Commission and the Advance Research Projects Agency to ascertain possible cooperation with these and similar agencies. (Much like the Air Force and the IGY Program.) But there was no second, so the motion was LOST.

29) On motion of Mr. Crossley, unanimously VOTED that the General Manager be instructed to make renewed

(*Continued on page 152*)

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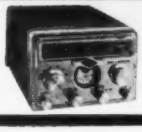

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examination of the factors involved in establishing reciprocal operating agreements with all countries willing to enter into them, and report to the ARRL membership and Directors through the League publication, *QST*.

30) On motion of Mr. Gowan, the following Resolution was unanimously ADOPTED:

WHEREAS, on December 6, 1958, Donald H. Mix completed 25 years of continuous service to the American Radio Relay League,

BE IT RESOLVED, that the Board of Directors meeting in Hartford, Connecticut, on May 15, 1959, in recognition of Donald H. Mix's untiring efforts on behalf of the League, does hereby express its deep appreciation of his loyalty, fidelity, and intelligent devotion to the best interest of amateur radio.

31) Moved, by Mr. Canfield, that By-Law 4 of the Articles of Association and By-Laws be amended to provide that the dues shall be $5.00 per year in the United States and Possessions, $5.25 in the Dominion of Canada. After extended discussion moved by Mr. Denniston, to amend the By-Law to provide that the dues shall be $4.50 per year in the United States and Possessions, $4.75 in the Dominion of Canada. After further discussion, moved, by Mr. Payne, that the motion be further amended to provide that the new dues rate shall become effective August 1, 1959. The yeas and nays being ordered, Mr. Payne's motion to set an effective date was decided in the affirmative: whole number of votes cast, 16; necessary for adoption, 9; yeas, 15; nays, 1. All the directors voted in the affirmative, except Mr. Reid who voted opposed. So Mr. Payne's amendment was ADOPTED. After further discussion, on motion of Mr. Crossley, VOTED that the matter be laid on the table for consideration later in the meeting.

32) On motion of Mr. Payne, unanimously VOTED that the General Manager is hereby authorized to reimburse the division directors for actual expenses incurred by them during the year 1959, in the proper administration of ARRL affairs in their respective divisions, up to amounts as follows:

Canadian Division Director	$1000
Atlantic Division Director	2000
Central Division Director	2000
Dakota Division Director	800
Delta Division Director	750
Great Lakes Division Director	800
Hudson Division Director	900
Midwest Division Director	900
New England Division Director	500
Northwestern Division Director	1000
Pacific Division Director	2000
Roanoke Division Director	500
Rocky Mountain Division Director	800
Southeastern Division Director	1800
Southwestern Division Director	1500
West Gulf Division Director	1500

33) On motion of Mr. Gowan, unanimously VOTED that the General Manager is hereby authorized to pay expenses for the operation of ARRL committees during the year 1959, but not to exceed amounts as follows:

Planning Committee	$ 500
Finance Committee	500
Membership & Publications Committee	500
Merit & Awards Committee	200
Housing Committee	2500

34) The Board was in recess from 3:18 P.M. to 3:30 P.M.

35) On motion of Mr. Born, unanimously VOTED that, to continue the Board's policy of reimbursing Section Communications Managers and QSL Managers of the League for certain travel in furthering ARRL organizational activities, the General Manager is hereby authorized to pay during the year 1959, a total amount not to exceed $7,000, under terms prescribed by the Communications Manager following the general pattern established by the Board.

(*Continued on page 154*)

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36) On motion of Mr. Kahn, unanimously VOTED that, to continue the Board's policy of reimbursing Section Emergency Coordinators for certain travel in furthering ARRL organizational activities, the General Manager is hereby authorized to pay during the year 1959 a total amount not to exceed $6,000, under terms prescribed by the Communications Manager following the general pattern established by the Board.

37) On motion of Mr. Engwicht, unanimously VOTED that the General Manager is hereby authorized to pay, during the period between January 1, 1960 and the 1960 meeting of the Board, expenses against usual authorizations for administrative and committee operations in no greater amounts than 1959 authorized amounts.

38) At this point, Mr. Chaffee, as Chairman, read the report of the Finance Committee, and on his motion it was unanimously VOTED to accept the Committee's recommendations.

39) Mr. Brabb, as Chairman, reported for the Planning Committee; whereupon, on motion of Mr. Crossley, unanimously VOTED to adopt the recommendations of the Committee.

40) Moved, by Mr. Crossley, to amend Article 8 of the Articles of Association, in accordance with recommendations of the Planning Committee, by adding a sentence at the end of Article 8 to read as follows: The vice-director shall also serve as director at any meeting of the Board of Directors which the director is unable to attend. The yeas and nays being ordered, the question was decided in the affirmative; whole number of votes cast, 16; necessary for adoption, 9; yeas, 16; nays, 0. All the directors voted in the affirmative. So the Article was AMENDED.

41) Mr. Born, as Chairman, reported for the Membership & Publications Committee. On motion of Mr. Born, after extended discussion, VOTED, 9 votes in favor to 7 opposed, that the League publish a Novice handbook.

42) Mr. Canfield, as Chairman, reported for the Housing Committee. On motion of Mr. Canfield, after extended discussion, unanimously VOTED that the Housing Committee be authorized to negotiate with the owner of property located at 855 Asylum Avenue, Hartford, Connecticut, on the basis of a trade of property located at 38 La Salle Road, West Hartford, Connecticut, on possible purchase of property at 855 Asylum Avenue, Hartford, Connecticut, with the end in view of arriving at the best possible basis of trade, sale or purchase, the Housing Committee to submit its recommendations to the directors through the Secretary for approval or disapproval of the Board members, and if the recommendations of the Committee be approved by a majority of the directors, the General Manager is authorized and directed to take all necessary actions to carry out the recommendations of the Housing Committee.

43) On motion of Mr. Roberts, unanimously VOTED that, pursuant to the terms of the Trust Agreement under the Pension Plan, the following persons are appointed to serve as a Pension Committee from June 2, 1959, to June 2, 1960: Arthur L. Budlong, George Grammer, and David H. Houghton.

44) At this point, the Chair announced the following committee appointments for the coming year:

Finance Committee:
Mr. Chaffee, Chairman
Mr. Maer
Mr. Payne

Planning Committee:
Mr. Brabb, Chairman
Mr. Denniston
Mr. Kahn

Membership & Publications Committee:
Mr. Born, Chairman
Mr. Doyle
Mr. Gowan

(*Continued on page 156*)

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Why Flounder?

SEE PAGE 173

Merit & Awards Committee:
Mr. Anderson, Chairman
Mr. Budlong
Mr. Engwicht

Housing Committee:
Mr. Canfield, Chairman
Mr. Anderson
Mr. Chaffee
Mr. Roberts
Mr. Budlong

The Chair assigned to the Planning Committee the matter of the investigation of possible TV programs on amateur radio.

45) Moved, by Mr. Crossley, that the second sentence of Article 7 of the Articles of Association be changed to read as follows: The Board of Directors, in its discretion, may also appoint from amongst the directors not more than three additional members of the Executive Committee to serve for fixed terms between regular meetings of the Board of Directors. And to add a new sentence immediately thereafter to read: The Board of Directors, in its discretion, may also appoint from amongst the officers, directors, or employees of the League, not more than two special members of the Executive Committee who shall possess all of the rights and duties of regular members of the Executive Committee save the right to vote, to serve for fixed terms between regular meetings of the Board of Directors. The yeas and nays being ordered, the question was decided in the affirmative: whole number of votes cast, 16; necessary for adoption, 9; yeas, 16; nays, 0. All the directors voted in the affirmative. So the Article was AMENDED.

46) On motion of Mr. Canfield, unanimously VOTED to lift from the table the matter of amendment of By-Law 4, concerning membership dues. On the question of the amendment of By-Law 4 to provide that the dues shall be $4.50 in the U. S. and Possessions, and $4.75 in the Dominion of Canada, the motion to amend was unanimously REJECTED. The question then being on Mr. Canfield's original motion to amend By-Law 4 to provide that the dues shall be $5.00 in the U. S. and Possessions and $5.25 in the Dominion of Canada, without objection, ORDERED by the Chair that the effective date shall be August 1, 1959. The yeas and nays being ordered, the question was decided in the affirmative: whole number of votes cast, 16; necessary for adoption, 11; yeas, 15; nays, 1. All the directors voted in the affirmative, except Mr. Reid who voted opposed. So the By-Law was AMENDED.

47) Moved, by Mr. Canfield, to amend By-Law 5 to change the figures of $4.00 and $4.25 to read $5.00 and $5.25, respectively, effective August 1, 1959. The yeas and nays being ordered, the question was decided in the affirmative: whole number of votes cast, 16; necessary for adoption, 12; years, 15; nays, 1. All the directors voted in the affirmative, except Mr. Reid, who voted opposed. So the By-Law was amended.

48) On motion of Mr. Crossley, unanimously VOTED that John G. Doyle is appointed to the Executive Committee to serve until the next annual meeting of the Board.

49) On motion of Mr. Meyers, unanimously VOTED that Morton B. Kahn is appointed to the Executive Committee to serve until the next annual meeting of the Board.

50) On motion of Mr. Canfield, unanimously VOTED that Milton E. Chaffee is appointed to the Executive Committee to serve until the next annual meeting of the Board

51) On motion of Mr. Born, unanimously VOTED that F. E. Handy is appointed a special member of the Executive Committee to serve until the next annual meeting of the Board.

52) On motion of Mr. Doyle, unanimously VOTED that David H. Houghton is appointed a special member of the Executive Committee to serve until the next annual meeting of the Board.

53) The Board recessed for dinner at 6:12 P.M., reconvening at 8:40 P.M., with all directors and other persons hereinbefore-mentioned in attendance.

54) At this point, the General Manager discussed at length the situation in respect to the forthcoming International Tele-Communications Conference at Geneva, Switzerland, beginning in August, 1959. He indicated that President Dosland, General Counsel Segal, General Manager Budlong, Assistant General Manager Huntoon and Technical Director Grammer were being cleared to attend as advisers to the delegation of the United States, all at League expense with the exception of General Counsel

(Continued on page 168)

Segal, who would participate to the same extent as the other ARRL advisers but at his personal expense; he also indicated that Canadian Director Reid had been invited by the Canadian government to attend the conference as industry member of the Canadian delegation (at League expense). After extended discussion, on motion of Mr. Born, unanimously VOTED that there is hereby appropriated from the surplus of the League, as of this date, the sum of $25,000, for the purpose of defraying the expenses of League participation in the Ordinary Administrative Radio Conference at Geneva, Switzerland, commencing August 17, 1959, any unexpended remainder of same to be restored to surplus.

55) On motion of Mr. Denniston, unanimously VOTED that the Board expresses its appreciation to Mr. Reid for making himself available to attend the conference.

56) On motion of Mr. Born, unanimously VOTED that the Board hereby expresses its sincere thanks and deep appreciation for the untiring work and devotion of the vice-directors, assistant directors, SCMs, SECs, and QSL managers of the League.

57) On motion of Mr. Born, unanimously VOTED that the Board go on record as commending the Field Engineering & Monitoring Bureau of the Federal Communications Commission for its assistance and cooperation rendered amateurs over the past year.

58) On motion of Mr. Canfield, affiliation was unanimously GRANTED to the Tombigbee Amateur Radio Club of Columbus, Mississippi and the Fayetteville High School Amateur Radio Club of Fayetteville, Arkansas.

59) At this point, Mr. Meyers reported on the activities of the Los Angeles Council of Radio Clubs in operating special-events station, K6USA, at the meeting of the CCIR in Los Angeles. On motion of Mr. Maer, unanimously VOTED that Director Meyers and his associates be commended for their fine work in connection with amateur activities at this affair.

60) On motion of Mr. Denniston, the following Resolution was unanimously ADOPTED:

That the Board of Directors of the American Radio Relay League extends hearty fraternal greetings to the amateurs from all parts of the world attending the Geneva conference.

61) Whereupon, on motion of Mr. Roberts, the Board adjourned *sine die* at 10:50 P.M. EDST.

62) (Time in session 8 hours, 55 minutes; total authorizations, $35,950; total appropriations from surplus, $25,000.)

A. L. BUDLONG
Secretary

REPORT OF THE FINANCE COMMITTEE TO THE BOARD OF DIRECTORS OF THE AMERICAN RADIO RELAY LEAGUE

The Committee met at the Hotel Statler, Hartford, Connecticut on Thursday, May 14, 1959. Present were President Dosland, Treasurer Houghton, Directors Chaffee and Maer.

Mr. Houghton reviewed the current cash position of the League which showed the May 13th balance to be some $226,000 on deposit at Connecticut Bank & Trust Company in two accounts. He also described the circumstances that from time to time require substantial cash, and commented on current financial policy governing his operations.

The matter of reducing current cash balances through short term investments was discussed. It being generally agreed that further study is desirable, the Chairman suggested that a meeting between Messrs. Budlong, Houghton, Huntoon and Chaffee and an officer of Conn. Bank & Trust Co., be arranged with the thought of securing advice on improved planning of this phase of financing. It was felt that the bank officer, after analysis of the League accounts, might be able to help plan a program of short term investments which, when coupled with normal cash balances, would maintain a proper degree of liquidity and maximum yield. This proposal was acceptable to those present and will be carried out.

Mr. Maer suggested that committee members receive copies of the monthly reports currently sent by the Treasurer to the Committee Chairman and the President.

Discussion brought out the suggestions that we might (1) invest for longer term some $25,000 of present cash, (2) increase balances in present savings accounts in savings banks for maximum interest, and (3) transfer the savings account at Conn. Bank & Trust Co. to a savings bank and thus increase the interest return from 2% to 3% or better.

(*Continued on page 160*)

However, it was decided that these suggestions be tabled until after the meeting with the bank officer.

The Committee expressed satisfaction with other aspects of the League finances and accounting.

It was agreed that a report of progress should be distributed to the Board membership when the above suggestions have been carried out.

Respectfully submitted,
MILTON E. CHAFFEE, W1EFW
Chairman, Finance Committee

REPORT OF THE MEMBERSHIP AND PUBLICATIONS COMMITTEE TO THE BOARD OF DIRECTORS OF THE AMERICAN RADIO RELAY LEAGUE

It is the opinion of the Committee that *QST* and its increasing size is attracting favorable attention from League members everywhere and that the quality of all League publications; including *QST*, must be maintained. An increase in membership cost which may be voted at this meeting is more desirable than curtailment of the quality of League publications in any way.

The Headquarters staff is to be commended for its program of informing new licensees of the services of the League and its solicitation of new members. This Committee recommends to the Board of Directors that the Headquarters staff be instructed to prepare and publish a Novice Handbook. Price not to exceed $1.50.

Respectfully submitted,
JAMES P. BORN, JR., W4ZD
Chairman, Membership and Publications Committee

San Marino

(*Continued from page 47*)

finements on the gamma match was immediate—leave it alone. For two hours I had a ball! Every district but W7 was worked and almost invariably, the report was 5 by 9.

At 1945 GMT, Rowland at W4TWW reported that I was the *only* European station he could hear. Almost as if a curtain had been drawn, the first act of this ham's dream came to an end. There were no more signals on 10. Not content with going to bed yet, I threw a 16-foot piece of wire out of the window and hooked Irv at W2IYW for my first s.s.b. contact on 20 from San Marino! This so encouraged me that I went up to the roof again to determine the feasibility of erecting the dipole for 20, even though it was pitch dark outside. The wind nearly blew me off the roof. Since a misstep would mean a fall of nearly a hundred feet, discretion gradually overwhelmed valor. After a couple more unsuccessful attempts on 20 with the piece of wire, I folded my arms in tired, happy sleep.

Heavy Breezes

At dawn I was awakened by a violent rapping on my door. "Radio antenna, she is kaput", was the unhappy greeting at the outset of my second day as an M1. A quick rooftop check revealed that the aluminum tubing mast had bent in the middle, almost 90 degrees. The wind had been terrific, but the beam was intact. With the help of the electrician I straightened it, wired it upright with baling wire, rope and a 2" by 6" plank. The meter on the KWM-1 indicated that the s.w.r. was still acceptable, but the band was

(*Continued on page 162*)

dead. There was no alternative but to get the 14 Mc. dipole up and ready for the evening's opening on that band.

At 1212 GMT, signals started to break through. The low end of 10 seemed a bit the best spot; W1GOU on a.m. was the first station to be worked. He was followed by W1LLF. Bob volunteered to get the information about the DXpedition on the evening ARRL Bulletin. I was informed subsequently that it got out also on the ham program on the Voice of America, put out by Bill Leonard, W2SKE. Furthermore, Walt at W1QNC had gotten the word to W4KVX, so that his fine *DX Bulletin* had alerted many to the expedition.

A short time later when I worked Dorothy at K2MGE, she told me that she had just heard of the M1 station and had quit in the middle of scrubbing her kitchen floor to get through for a new country.

Shortly after this contact, I worked an entire family. Dad is Lou of W3FWD, Mom is Elsie of W3ICQ and Junior is Ron, with the call W3HCO. Ham radio again proved to be a hobby with interest for all ages.

After a most successful day of operating on 10, a crimp was put in my pleasure. I was advised that I was causing a little TVI! This once-in-a-lifetime opportunity was too good to miss, yet here I was, a guest in a foreign country, but bothering their biggest evening entertainment. Investigation revealed that TVI only occurred when I was on 10. Also, the TV antennas were very close to mine. Joe at K2QLW gave me a big assist by acting as an ether cop for me. Later, Luigi of W3MAC helped materially. They lined up the fellows calling I1EZZ/M1, so that about all I had to do was acknowledge reports and give my report. This kept transmissions very short. I worked fairly well until 1907 GMT at which time 10 folded with my contact with W2VIA and his 550-foot long wire.

After such a busy day I was about whipped, when Mike (Captain Ruggiero of W2NVR) walked into the shack. (I'm not sure that the owner of the hotel would appreciate my calling one of his brand new rooms a shack!) Mike had hoped to arrive sooner, but he was busy back at my own office helping to get out the work while I was on military leave. While I caught some sleep he had the time of his life nearly all night on 14.305 Mc. He used the Collins receiver (R388/URR), listening in the 14.28 to 14.30 Mc. range for Stateside stations.

Dawn broke revealing a second catastrophe. Another night of high wind had broken the 10-beam again. With the last of the baling wire, repairs were effected and operation on 10 progressed again at a merry pace. Pile-ups were so bad that at times there were 20 to 30 stations calling, all within a few kc.

KH6IJ Again!

At 0810 GMT, 6 March, I1EZZ/M1 closed down with the contact with KH6IJ. Faced with

(*Continued on page 164*)

the necessity of getting back to our office in the Headquarters of the Southern European Task Force (SETAF) at Verona, the big switch was pulled with great reluctance.

This little story of our experience in San Marino was prompted by the fact that there were so many questions about San Marino and our operations there. I don't know how many times I answered, "No, this is not an island", or "No, this is not San Marino in California." I'm sure that on many occasions I was a bit curt in the transmissions, but it was only to utilize the operating time to the maximum and make happy as many hams as I could. Although I have no statistics on this, I would estimate that this DXpedition provided a new and quite rare country for at least 275 hams throughout the world. In the short period of activity at San Marino, it would have been impossible to attempt to make DXCC and still give the U. S. amateurs a good break. Although many countries were worked, from the Arctic to Australia, the who-to-answer dilemma was often resolved in favor of the U. S. hams, many of whom are my very good friends of long standing. If I have one regret as a result of this sojourn in San Marino, it is that we simply could not work all of the hundreds of fellows and YLs throughout the world who called I1EZZ/M1. QST

Strays

"Operation World Wide A Success" Says Ralph Charbeneau, W8OLJ

During the months of April and May MATS "Operation World Wide" visited locations all over the world during the course of producing a motion picture on the world wide combat support mission of MATS. Two prominent amateurs on board the C-54 were Ralph Charbeneau, W8OLJ, and William Drobisch, W9QVA. W8OLJ, at the left, spark-plugged organization of the flight, while W9QVA, on loan from Hallicrafters, supervised installation of the gear used on board the plane.

Hey! Why Aren't We Remembered?

BY JOE A. ROLF,* K5JOK

SILVER plaques and gold-plated rigs are awarded annually to the outstanding hams of the nation. Fame and prestige is theirs, and certainly their accomplishments demand such. But sadly, the average ham — unknown and unappreciated — is often overlooked. He is the one who really makes hamming unforgettable.

It is only proper that some of these average people be honored. Their activities win no prizes, claim no fame, but if there happen to be any awards left over after this year's round they should be passed out to the following. If there are not enough to go around . . . a moment of tribute will surely do.

Outstanding Communications

The ham who managed to work every monitoring station in the country with only 25 watts.

The Novice on 75 meters who called CQ only three times and then signed. Also, the one on 40 who gave his handle less than four times and remembered to mention his QTH.

The hopeful Technician on 21,000 Mc. who got up every morning at six and faithfully called CQ DX for a solid hour.

The 15-meter mobile in New York who happened to contact a long-lost brother in DL-land just before entering the Hudson tunnel.

The operator who couldn't make a single contact during Field Day.

The fellow on the West Coast who tried to contact the G2 who was calling CQ YL Bombay, India.

The YL who personally tuned up the rig for her morning net.

The ham down the street who plugged his mike into the receiver headphone jack and worked a KH6 with a 5-9 report.

(*Continued on page 166*)

* Box 594, Jonesboro, Arkansas

Outstanding Construction

The author of a six-page article on beams that everybody understood.

The K4 who built a kilowatt rig around surplus tubes. (The only distributor to stock them was located in Alice Springs, Australia.)

The ham who broke a world record when he blew 124 boxes of 5A fuses in eight months. (The previous record was somewhere around 85.)

The antenna hound who hooked his long wire to a utility pole and pulled the pole over on his neighbor's new carport.

The fellow who used a grid-dip meter to v.f.o. the rig in his logging truck.

Miscellaneous or Red-Faced Dept.

The operator in the middle of ten who called CQ-75 for thirty minutes before he finally found out where he was. Also, the amateur station on 11 meters last night.

The little fellow on 7256 kc. who admitted he had never caught a fish worth talking about.

The sidebander who was forced to agree that his rig was working perfectly.

The operator who owned up to the fact that he TVI'd his own TV set.

The many of us who, during the past year, attempted to prove that a one-watt resistor can safely be substituted for the ten-watt size.

Strays

Several of our QSL Managers are receiving cards addressed to amateurs in their call areas which have been sent by hams in other parts of the U. S. The League's QSL Bureau System is set up to handle only cards from foreign amateurs to W/K/VE/VO addressees. QSLs for domestic contacts should be sent directly to the station worked, *not* through the bureau. See page 190 this issue for details on how the system works for DX cards.

—···—

Winebaum's Book Store in Portsmouth, N. H., has been running a newspaper ad headed "Relax With a Good Book." First on their list is the *Radio Amateur's Handbook*. — *K1CJO*

Silent Keys

It is with deep regret that we record the passing of these amateurs:

W1DP, James W. Wilson, Fall River, Mass.
W1GLZ, Victor R. Burnell, Norway, Me.
K1JAE, Oscar N. Lafreniere, North Kingstown, R. I.
K2LXO, Joseph A. Argust, Staten Island, N. Y.
W4JZ, Arno B. Meyers, St. Petersburg, Fla.
W5ED, George R. Jelinek, Dallas, Tex.
W5KSW, Keith Thomas Maring, Brownsville, Tex.
W5OST, Hubert C. Luckett, San Antonio, Tex.
K5PZO, Sam M. Ashley, Dallas, Tex.
W6DO, George B. McElwain, San Francisco 12, Calif.
K6HRF, Joy P. Miller, Sacramento, Calif.
K6MMR, David D. Cox, Orangevale, Calif.
K6QGZ, Albert J. Valla, Atascadero, Calif.
W6QMF, Edward L. Sutherland, Toyon, Calif.
W6WJN, Carroll R. Messler, Concord, Calif.
W7FWD, Orpheus U. Tatro, Olympia, Wash.
W7IVD, Ronald C. Schubach, Cut Bank, Mont.
W7III, Harold A. Bustard, Havre, Mont.
W7NWU, Ezra Williamson, Gabbs, Nev.
W8BN, Paul M. Barnes, Toledo, Ohio
W8CSF, Floyd A. Zerber, Michigan City, Ind.
W8DOV, John L. Workman, Clawson, Mich.
K8EMC, Robert W. Dellinger, North Olmsted, Ohio
K9EPX, David H. Peterson, Northfield, Minn.
W9ZGN, Robert W. McGowan, Homewood, Ill.
KNØCBT, Frank B. Collom, Cripple Creek, Colo.
WØIZS, Frank W. Ross, Fairmont, Minn.
WØMUL, M. Lee Wilson, Jeffers, Minn.
F8FR, Robert Dubs, Mulhouse, Haut-Rhin, France
VE3ANY, R. Gordon Coleman, Toronto, Ontario, Canada
VE3DAU, James H. Copeland, Gananoque, Ontario, Canada
VE3DMX, Delima R. O'Shea, Fort William, Ontario, Canada
XE2CQ, Jose C. Gonzalez, Torreon, Coah., Mexico

Last month we listed in error W5PFD, Clifton C. Ferguson, jr., of Jackson, Miss. The correct listing should have been W5PFC, Clifton C. Ferguson, sr., of Jackson, Miss. Our apologies for this error.

FEEDBACK

If you'll refer back to page 38 of *QST* for January, 1959, you'll see that the value of the sweep width control was inadvertently omitted. It should be 500K for proper operation of "The Electronic Eyeball."

July, 1934

. . . W2AOE had an interesting story on automatic DX relay work for the amateur, using 56 Mc. Another 56-Mc story, reported the first successful 56-Mc. relay between Boston and New York.

. . . W8PK described a vacuum-tube type modulation meter, while W3AMM discussed the use of a light bulb as a resistor.

(*Continued on page 172*)

. . . W7ALH showed a transportable station using a pair of type 46s in the final, driven by a type 59. Including a t.r.f. receiver, the whole thing weighed 40 lbs.

. . . There was a report on the latest 28-Mc. doings, and W4CCH described a relay rack that could be built for two dollars (1934 prices).

. . . Perhaps the principal item of historical note in this issue of 25 years ago is the 14-Mc. rotary beam, the first of its kind described by John P. Shanklin, W3CIJ. There had previously been movable beams, but this appears to have been the first that was rotatable.

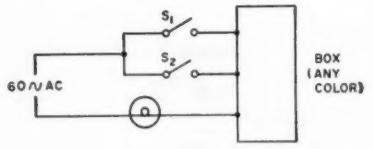
. . . Three pages of hints and kinks for the experimenter.

. . . A station description of W6ITH, who is still very active. . . . All that in just 80 pages.

Quist Quiz

Here's a non-mathematical Quiz for the circuit champs, donated by Fred Brown, W6HPH of Santa Barbara, Calif.

The lamp lights when either S_1 or S_2 is closed, but goes out when *both* are closed! Query: What is in the box? (The solution of W6HPH involves no relays, but there is no law that says you can't work out that answer too.)



You should have your slide rule and 6-inch scale taken away if you couldn't find quickly that, in last month's Quiz, R_1 = 30 ohms.

Strays

K1DSW, left, and W1DSW met for the first time at the May ARRL convention at Swampscott, Mass. They discovered both were named John (John Milne and John MacGahan) and both lived a few miles from Boston.

A.R.R.L. QSL BUREAU

The function of the ARRL QSL Bureau system is to facilitate delivery to amateurs in the United States, its possessions, and Canada of those QSL cards which arrive from amateur stations in other parts of the world. Its operation is made possible by volunteer managers in each W, K and VE call area. All *you* have to do is send your QSL manager (see list below) a stamped self-addressed emvelope about 4¼ by 9½ inches in size, with your name and address in the usual place on the front of the envelope and your call printed in capital letters in the upper left-hand corner.

W1, KI — G. L. DeGrenier, W1GKK, 109 Gallup St., North Adams, Mass.

W2, K2 — North Jersey DX Association, Box 55, Arlington, New Jersey.

W3, K3 — Jesse Bieberman, W3KT, P.O. Box 400, Bala-Cynwyd, Pa.

W4, K4 — Thomas M. Moss, W4HYW, Box 644, Municipal Airport Branch, Atlanta, Ga.

W5, K5 — Brad A. Beard, W5ADZ, P.O. Box 25172, Houston 5, Texas.

W6, K6 — Horace R. Greer, W6TI, 414 Fairmount Avenue, Oakland, Calif.

W7, K7 — Salem Amateur Radio Club, P.O. Box 61, Salem, Oregon.

W8, K8 — Walter E. Musgrave, W8NGW, 1245 E. 187th St., Cleveland 10, Ohio.

W9, K9 — J. F. Oberg, W9DSO, 2601 Gordon Drive, Flossmoor, Ill.

WØ, KØ — Alva A. Smith, WØDMA, 238 East Main St., Caledonia, Minn.

VE1 — L. J. Fader, VE1FQ, P.O. Box 663, Halifax, N. S.

VE2 — George C. Goode, VE2YA, 188 Lakeview Ave., Point Claire, Montreal 33, Que.

VE3 — Leslie A. Whetham, VE3QE, 32 Sylvia Crescent, Hamilton, Ont.

VE4 — Len Cuff, VE4LC, 286 Rutland St., St. James, Man.

VE5 — Fred Ward, VE5OP, 899 Connaught Ave., Moose Jaw, Sask.

VE6 — W. R. Savage, VE6EO, 833 10th St., North Lethbridge, Alta.

VE7 — H. R. Hough, VE7HR, 1684 Freeman Rd., Victoria, B. C.

VO1 — Ernest Ash, VO1AA, P.O. Box 8, St. John's, Newf.

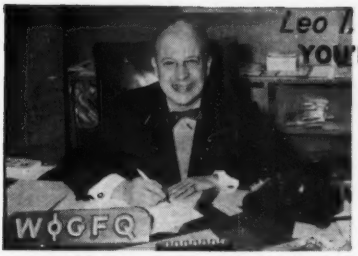
VO2 — Douglas B. Ritcey, Dept. of Transport, Goose Bay, Labrador.

KP4 — E. W. Mayer, KP4KD, Box 1061, San Juan, P. R.

KH6 — Andy H. Fuchikami, KH6BA, 2543 Namanu Dr., Honolulu, T. H.

KL7 — KL7CP, 310–10th Ave., Anchorage, Alaska.

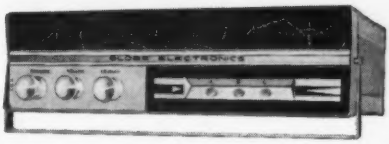
KZ5 — Catherine Howe, KZ5KA, Box 407, Balboa, C. Z.



Leo I. Meyerson, WØGFQ, World Radio, Says:

YOU'LL GET THE MOST FROM THIS BRAND NEW

Citizens Broadcaster CB-100



ANYONE CAN USE!

NO TESTS REQUIRED

25 Hams here offer you the best of personalized service. We make same-day shipment from the center of the U.S.A. Easy terms with only 10% down payment. Country's highest trades made. Fast turnover guaranteeing latest serial numbers. All these features and more you'll find when trading with **"the house the hams built"**

$13.00 Down

$10.73 Per Mo.

or $129.95 Cash

★ Universal operation. One unit works on 115V AC or 12V mobile. Operates in Home, Office, Car or Field. No tests or examinations required*. Any citizen over 18 years of age may use any of the FCC-assigned 22 channels in the 27mc range (11 meters) for transmitting and receiving.

★ EXCLUSIVE! Channel switch allows choice of three channels for operation. Receiver and broadcaster units are tuned to same channel simultaneously.

★ Operation extremely easy; only three controls; Channel, Squelch and On/Off/Volume. Squelch control subdues background noise for muted standby operation. Offers push-to-talk operation for instantaneous transmission or reception.

★ 10 Tube Receiver/Transmitter is crystal controlled for stable operation. With proper crystals, all channels are covered. Tested pairs available for any channel.

★ Power Input: — 5 watts. AM modulated. Compact: — only 3½x13x10½". Light weight, 9 lbs. Meets all FCC requirements.

★ Modern "living room" design. Carrying handle also acts as tilt stand for fixed operation or mounting bracket for permanent installation, making the Broadcaster extremely versatile.

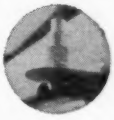
*Simply fill out FCC Form 505

WITH ONE OF THESE

Citizen Bander ANTENNAS

Model CW
Low cost telescoping whip designed for transceiver mounting. May also be used with Hy-Gain auto door mount for temporary mobile use. Attractive chrome plated whip extends to overall heights of 45" and telescopes down to only 15" for easy carrying and storage. Base loading coil completely enclosed in polyethylene cover. Complete with PL259 coax connector for simple screw-in attachment to most Citizen Band Transceivers or Hy-Gain Mobile door mount. Swivel joint permits attachment to top or back of unit.

the Citizens Whip $6.95



Model No. ADM
Auto door mount complete with SO-239 receptacle for mounting model CW Citizens Whip. Attaches quickly and easily to the door top of most autos. Price **$3.95.**

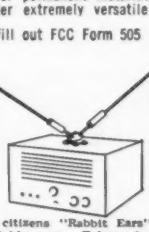
Model No. CC-12
Coaxial cable kit for use with auto door mount - 12 feet of RG58U with soldering lugs on one end and PL259 Coax connector on other end. Price **$2.95.**

the Citizens Mobile $11.95

Model CM
Chrome plated and stainless steel telescoping whip extends to 73" and down to only 23" for easy garaging. Weatherproof, polyethylene enclosed, high efficiency base loading coil includes exclusive Hy-Gain "L" matching network for perfect 50 ohm match. Complete with universal swivel body mount, only one hole to drill for easy mounting.

CC-12 Coaxial Kit - 12 feet of RG58U with soldering lugs on one end and PL259 coax connector on the other end. Price **$2.95.**

the Citizens Dipole $12.95



Model CD
High efficiency citizens "Rabbit Ears" for top performance - indoors or portable use. Telescoping chrome plated whips extend to 45" and telescope down to 15" for easy storage and carrying. Uniquely designed suction cup base for quick and easy mounting on transceiver, walls or window panes, etc. May be oriented either horizontally or vertically. High efficiency base loading coils include exclusive Hy-Gain "L" matching network for perfect 50 ohm match. Loading coils and matching network enclosed in polyethylene covers. Provided with six feet of RG58U coaxial cable and PL259 coax connector.

Citizens Ground Plane $16.95

For high efficiency point-to-point or station-to-mobile. Easily mounts on flat or peaked roof. Less feed line.

Heavy Duty Ground Plane $29.95

Commercial duty (100 mph rating) ground plane. Only top construction materials. Mountable on high masts, poles, for long range communication.

Citizens Beam $29.95

3-element beam for 8.5 db forward gain. Multiplies power 7 times. For long range point-to-point communication . . . 50 miles or more. Extremely sturdy; yet may be rotated by any TV rotor.

Rush your FREE Catalog ☐ and complete info on ☐ Citizens Broadcaster
☐ Hy-Gain Citizens Antennas

WORLD'S MOST PERSONALIZED RADIO SUPPLY HOUSE

World Radio LABORATORIES

PH 2 0277

ELECTRONIC LABORATORIES

515 W BROADWAY COUNCIL BLUFFS IOWA

☐ **Send Latest Reconditioned Eqpt. List**

Name: _____

Address: _____

City & State: _____ Q-7

HAM-ADS

(1) Advertising shall pertain to radio and shall be of nature of interest to radio amateurs or experimenters in their pursuit of the art.

(2) No display of any character will be accepted, nor can any special typographical arrangement, such as all or part capital letters be used which would tend to make one advertisement stand out from the others. No Box Reply Service can be maintained in these columns nor may commercial type copy be signed solely with amateur call letters.

(3) The Ham-Ad rate is 30¢ per word, except as noted in paragraph (6) below.

(4) **Remittance in full must accompany copy, since Ham-Ads are not carried on our books. No cash or contract discount or agency commission will be allowed.**

(5) Closing date for Ham-Ads is the 20th of the second month preceding publication date.

(6) **A special rate of 7¢ per word will apply to advertising which in our judgment, is obviously noncommercial in nature.** Thus, advertising of bona fide surplus equipment owned, used and for sale by an individual or apparatus offered for exchange or advertising inquiring for special equipment, takes the 7¢ rate. Address and signatures are charged for. An attempt to deal in apparatus in quantity for profit, even if by an individual, is commercial and all advertising so classified takes the 30¢ rate. Provision of paragraphs (1), (2) and (5), apply to all advertising in this column regardless of which rate may apply.

(7) **Because error is more easily avoided, it is requested copy, signature and address be printed plainly on one side of paper only. Typewritten copy preferred but handwritten signature must accompany all authorized insertions.**

(8) No advertiser may use more than 100 words in any one issue nor more than one ad in one issue.

Having made no investigation of the advertisers in the classified columns except those obviously commercial in character, the publishers of QST are unable to vouch for their integrity or for the grade or character of the products or services advertised.

QUARTZ — Direct importers from Brazil of best quality pure quarts suitable for making piezo-electric crystals. Diamond Drill Carbon Co., 248 Madison Ave., New York City 16.

MOTOROLA used FM communications equipment bought and sold W5BCO, Ralph Hicks, 204 E. Fairview, Tulsa, Okla.

WANTED: Cash or trade, fixed frequency receivers 28/42 Mc. W9YIY, Troy, Ill.

WANTED: Early wireless gear, books, magazines, catalogs before 1922. Send description and prices. W6GH, 1010 Monte Dr., Santa Barbara, Calif.

KWM-1 wanted. Also few high plate dissipation tubes, radios BC348, ARN14, ARN30. ARC3, 51 Series Gear 51J, 51R, communication receivers, transmitters. Dames, W2KUW, 308 Hickory, Arlington, N. J.

ATTENTION Mobileers! Leece-Neville 6 volt 100 amp. system alternator, regulator & rectifier, $45.00. Also Leece-Neville 12-volt 100 amp. system, alternator, regulator & rectifier, $85.00. Good condition. H. A. Zimmerman Jr., K2PAT, 115 Willow St., Brooklyn 1, N. Y. Ulster 2-3472.

SAN FRANCISCO and vicinity. Communication receivers repaired and realigned. Guaranteed work. Factory methods. Special problem, invited, any equipment, Associated Electronics, 58 South P St., Livermore, Calif. W6KF, Skipper.

TRANSFORMERS (3) W2EWL Special, $3.00 postpaid. S8B, latest diagram, template, 3 xfrmrs, disc ceramic Emica condensers, coils L1 thru L7 for W2EWL Special (Mar. 1956 *QST*), $10.95 postpaid. Vitale, W2EWL. Denville, N. J.

COAXIAL Cable. New surplus RG-54A/U, 58 ohms impedance — 30 ft. prepaid, $1.00. Radio magazines, buy, sell, trade, R. Farmer, 3009 No. Columbia, Plainview, Texas.

KNOX Electronic Supply, Inc. "Where your Trade-In is always worth more!" 67 N. Cherry St., Galesburg, Ill.

ANTENNA 80–40–20–15–10, $21.95. Patented. Lattin, W4JRW, Box 44, Owensboro, Ky.

HALLICRAFTERS, Drake. Central Electronics, Gonset, Ham gear, Jerry W8EPI, Swartzlander Radio Limited, 1220 Stillwell Avenue, Fremont, Ohio.

FIFTH Annual Syracuse VHF Roundup, October 10, 1959

WANTED: Battery receivers of 1920s, Eria, Acme, Radiola, Grebe, etc. Also UV199 thru UV206 tubes for electrical test. Buy or borrow. Grote Reber, Green Bank, West Virginia.

MICHIGAN Hams! Amateur supplies, standard brands. Store hours 0830 to 1730 Monday through Saturday. Roy J. Purchase, W8RP, Purchase Radio supply, 327 E. Hoover St., Ann Arbor, Michigan. Tel. NOrmandy 8-8262.

AUTHORIZED factory distributors for Adjustavolt, B&W, Elmac, Geloso, General Electronics, Glass-Line, Gonset, Hammarlund, Hexacon, Johnson, National, Penta, TMC, Tobe & Vocaline & Westinghouse. Wanted: xmtrg. and special-purpose tubes and lab equipment. Trade-ins accepted. Open Monday through Saturday. Barry Electronics Corp., 51 Broadway, N. Y. 12, N. Y. Phone WAlker 5-7000.

WYOMING Hamfest July 25–26. Full program, banquet. Tourist mobiles welcome. See Hamfest Calendar this issue.

SALE! NC-173 receiver, speaker, and manual, guaranteed gud condx, slick iron grey finish. Bargain: $125. R. A. Brown, 2551 Gentry Dr., Wichita, Kans. KØLEB.

MERCURY Turnstile: A horizontally polarized omnidirectional mobile or fixed antenna. "The most for two meter mobile." $3.95. Mercury Enterprises, Box 273Q, Granby, Conn.

QSLS? SWLS? Finest and largest variety samples, 25¢ (refunded). Callbooks (Summer), $5.00 postpaid. Religious QSL samples, 10¢. "Rus" Sakkers, W8DED, P.O. Box 218, Holland, Mich.

DELUXE QSLS. Petty, W2HAZ, Box 27, Trenton, N. J. Samples, 10¢.

QSLS "Brownie," W3CJI, 3110 Lehigh, Allentown, Penna. Samples. 10¢ with catalogue, 25¢.

QSL-SWLS, 100, $2.85 up. Samples 10¢. Griffeth, W3FSW, 1042 Pine Heights Ave., Baltimore, Md.

QSLS-SWLS. Samples 10¢. Malgo Press, 1937 Glendale Ave., Toledo 14, Ohio.

QSLS. Twenty exclusive designs in 3 colors. Rush $3 for 100 or $5 for 200 and get surprise of your life. 48-hour service. Satisfaction guaranteed. Constantine Press, Bladensburg, Md.

QSLS. Samples, dime. Printer, Corwith, Iowa.

COLOR Glamor, scenic & nature. Custom sketch and photo. Samples 25 refunded. K4LFZ QSLS, Summerfield, Fla.

QSLS, Reasonable. 10 days delivery. Catalog dime (coin), Dick Crawford, K6GJM, Box 607, Whittier, Calif.

SCENIC QSLS. New, beautiful, samples 10¢. Camas Press. 3005-VC, North Hollywood, Calif.

200 QSLS, $3.00. Samples free. Bolles, 7701 Tisdale, Austin 5, Texas.

CREATIVE QSL and SWL Cards. Are you proud of your card? If not let us print your next order. Write for free samples and booklet. Personal attention given to all requests. Bob Wilkins, Jr., KN5ZMT, Creative Printing, P.O. Box 1064-C, Atascadero, Calif.

QSL Samples, 10¢. Refundable. Also Net Award Certificates and Membership cards. W3KPJ Press, 1806 Water St., Wesleyville, Penna.

QSLS Samples dime. Sims, 3227 Missouri Ave., St. Louis 18, Mo.

QSLS-SWLS. High quality, reasonable prices. Samples. Bob Teachout. W1FSV, 204 Adams St., Rutland, Vt.

QSLS. Glossy 4-colors, 100 for $3.50. Samples, 10¢. Dick, W8VXK, 1018 Arthur, Mt. Pleasant, Mich.

QSLS. Speedy delivery. Samples, 10¢. Don, K5OWT, 738 Gardenia Ada, Okla.

QSLS, SWL'S VHF'S SYL-OM's. (Sample assortment approximately 9¾¢). Covering designing, planning, printing, arranging, mailing, eye-catching, comic, sedate, fatabulous DX-attracting, prototypal, snazzy, unparagoned, cards. Rogers, KØAAB, 737 Lincoln Ave., St. Paul 5, Minn. Also glamorous, pulsating (Wow!)

CONELRAD Monitor, Morrow Radio Model CM-1, $20 cash, no trade-ins. W1VG, 99 Bentwood Rd., West Hartford 7, Conn.

QSLS. Get the best from DX, samples 25¢. 2 Kulik Street, Clifton, N. J. Shop telephone GRegory 3-4478. Residence, GRegory, 1-7885.

QSLS-SWLS, 100 $2.50. Samples 10¢. QSO File cards, $1.00 per 100. Rusprint, Box 7507, Kansas City 16, Mo.

QSLS, Taprint, Union, Miss.

SUPERIOR QSLS, samples 10¢, Ham Specialties, Box 3023, Bellaire, Texas.

QSLS-SWLS that are different. Colored, embossed card stock and "Kromekote." Samples 10¢. K8AIA, Turner, Box 953, Hamilton, Ohio.

QSLS: Send 25¢ (refundable) for samples. W6CMN, Schuch, 6707 Beck Ave., No. Hollywood, Calif.

QSLs, 3-color glossy, 100 — $4.50. Rutgers Vari-Typing Service, 7 Fairfield Rd., New Brunswick, N. J.

QSLS samples, quarter. Spicer, 4615 Rosedale, Austin 5, Texas.

QSLS, SWLS. Citizen's band. Samples 10¢. Onondaga Press, Onondaga Mich.

PICTURE QSL Cards for your shack, home, etc. Made from your photograph. 1000, $12.00. Raum's 4154 Fifth St., Philadelphia 40, Penna.

QSLS. Samples free. Phillips, W7HRG, 1708 Bridge St., The Dalles' Oregon.

QSLS, Lapel pins, samples dime. Kephart W2SPV, 4309 Willis, Merchantville, N. J.

QLS Neat. Attractive. Samples 10¢. Woody's, Box 164, Asher Sta., Little Rock, Ark.

HARRIS Press QSLS-SWLS. Free samples, 518 Milton St., Richmond, Va.

QSLS, SWLs, samples 5¢. Nicholas & Son Printery, P.O. Box 11184, Phoenix, Ariz.

C. FRITZ Says "If it's worth a QSL, let's do it right!" QSL-SWLS. In '59 try mine! Samples 25¢ deductible. 1213 Briargate, Joliet, Ill.

QSLS. Glossy 2 and 3-colors. Attractive, distinctive, different. 48-hour service. Samples 10¢. K2VOB Press, 62 Midland Blvd., Maplewood, N. J.

QSLS. New designs, reasonable. Paye, W4ZKK. 824 Avondale, Cocoa, Fla.

QSLS: Cartoons, colors, something different. Samples 25¢. Chris, W9PPA, 365 Terra Cotta, Crystal Lake, Ill.

QUALITY QSLS. Samples and prices, 5¢. Best deal around. Savory Press, 172 Roosevelt Rd., Weymouth, Mass.

QSLS-SWLS. Citizen's Band. Samples 10¢. W4BKT Press, 123 Main, McKenzie, Tenn.

QSLS. High quality, low prices. Fast service. Samples 10¢. Dave, 601 E. Maude, Sunnyvale, Calif.

QSL Special: $1.75 per 100 cards, postpaid U. S. only. Glossy stock, red call letters, name and address. Green QSO information, etc. All orders mailed within 10 days. Free sample. Hobby Print Shop, Umatilla, Fla.

QSLS. Cheap, medium, and expensive. Samples 15¢ (refundable). Elham, Inc. P. O. Box 98, Hawthorne, Calif.

QSLS. Outstanding — original — reasonable prices. Samples 10¢. Super quantity, 25¢. Refundable. VYS QSLS, 1704-Q Hale, Ft. Wayne, Ind.

NOVEL Reverse color QSL samples! Stamp appreciated. WAT, Box 1, Brecksville, Ohio.

QSLS. Stamp brings samples. Eddie W. Scott, W3CSX, Fairplay, Md.

RUBBER Stamps: Why wait for cards? QSL with rubber stamps. Sample impressions, immediate delivery. Kay, K2UKQ, Blanchet Rubber Stamp Co., 21 Lincoln Ave., Orange, N. J.

RUBBER Stamp for hams, sample impressions. W9UNY, Hamm, 542 North 93rd, Milwaukee, Wis.

HEATH Kits assembled, fifty per cent of the cost of kit, plus postage. Send kit or money for kit. I'll bill assembly charge. Robert Sisson, Rte. 2, Hartford, Michigan.

S.S.B. xfrmrs, exact set of 3 (hermetically sealed) for W2EWL Special, brand new, $3.00 postpaid. New compact G-E 100-watt modulation xfrmr, multi-impedance (10 lbs), $6.25; new Elmac vacuum condenser, 12 μμfd at 32 kilovolts. $5.50, G-E Pyrarols, 20 μfd at 1000 v.d.c. (350 vac) plus min. 4 for $6.00; 4 μfd at 1000 v.d.c. (330 vac)-min. 4 for $3.50. Please include postage, no c.o.d.'s. Tucker, W2HLT, 51-10 Little Neck Parkway, Little Neck 62, N. Y.

SAVE time, Save Money! DX QSL's forwarded 2 each after membership. Free flyer "DX QSL Co-op," Box 5938, Kansas City 11, Mo.

COMPLETE File *QST*s, 1915–1951 for sale. Landa, Clayton 2, Georgia.

HAM TV Equipment bought, sold, traded. Al Denson, W1BYX, Rockville, Conn.

WANTED: 6 to 12 304TL tubes. Callanan, W9AU, P.O. Box 155, Barrington, Ill.

SELL Or swap: Dumont oscilloscope 208 perfect, $35, Globe Scout 680 factory-wired xmttr, 80–6 meters, $75; ART-13 and RAL schematics, 50¢. W3IHD, 4905 Roanne Dr., Washington 21, D. C.

DX35, DX40 or similar rig wanted. Ted Dames, W2KUW, 64 Grand Place, Arlington, N. J.

NAMEPLATES! Your call letters. Photoengraved, raised letters with black background, 2" x 11/16" x .025" brass plates, for rigs, test equipment, tool boxes, doorbells, etc. Three of same call, $1.50. (Minimum order). Add'l. of same call, 35¢ ea. Postpaid. Taxpaid. Evert Laboratories, 235 E. Jackson, Lansing 6, Mich.

FOR Sale or swap: 4/25 amplifier with H.V. pwr. supp. and modulator. Rack mounted, fully metered; also other parts. Need: good quality rcvr, HRO, Collins class. J. Bruscella, W2LEC, 14 Glorney St., Shrewsbury, N. J.

CASH for your gear. We buy, trade or sell. We stock Hammarlund, Hallicrafters, National, Johnson, Gonset, Globe, Hy-Gain, Mosley and many other lines of ham gear. Ask for used equipment list. H & H Electronic Supply, Inc., 506–510 Kishwaukee St., Rockford, Ill.

HAMMARLUND PRO-310, factory reconditioned. Make an offer! Will consider as part payment on good 32V3. Douglas Stowe, W6QWJ, 2553 Nipomo, Long Beach 15, Calif.

"PIG-IN-A-POKE"? Not if you visit Ham Headquarters, USA and see and choose from the hundreds of "Like-New" bargains in the world-famous Harrison Trade-in Center. More for your money, because tremendous turnover makes lower overhead! Terms, trades. Send postcard for mouth-watering photograph and price list Q-6. For the best in all new and used equipment, it pays to come to "Ham Headquarters, USA"! BCNU, 73, Bill Harrison, W2AVA, 225 Greenwich St., New York City, N. Y.

BARGAINS: Reconditioned and fully guaranteed, HQ-100 $139.00 HQ-129X $158.95; HT-33 new Demo, $550.00, Heath Q Multiplier $8.49, NC-300 $279.00; KWM-1, 75A1, 75A2, NC-183D $289.00; Globe Chief 90 $44.00; Super PRO $94.50; Globe Scout 680 $89.95; HT-18 $39.95, RME-84 $59.95; Lysco 600 $59.50; Knight 50 watt $29.50; National SW-54 $34.95; AF 67 $139.00; PMR 6A $79.95; Harvey Wells T-90 $128.95; Globe King 275 $179.00; Central Electronics 20A $189.00; Side Band Slicers $59.00; Heath AT-1 $22.95; Hallicrafters S-53 $49.00; KWS-1, Morrow MBR-5 $159.00; MBS 60A $159.50; DX-20 $29.95; NC-173 $129.95; NC-125 $139.50; NC-88 $29.95; 32V3 $450.00, 32V2 $349.00; Globe King 500A $425.00; HQ-140XA $189.95, NC-109 $179.95. We trade new and used. Write Ken-Els Radio Supply, 428 Central Ave., Fort Dodge Iowa, or 128 — 31 Street, Cedar Rapids, Iowa.

SELL: KWS-1, $1550; 75A-4, $525; both together, $2000. Little used, both perfect. Herb Hollister, WØDRD, Box 17, Boulder, Colorado.

FOR Sale: B&W 5100-B transmitter $350; B&W 651 Matchmaster, $30; Electro-Voice 664 microphone with 419 stand, $40; Viking Adventurer, $80; Hammarlund HQ-140X receiver with crystal calibrator and speaker, $195; Panadaptor and 'scope ID-60/APA-10 with power supply for 115 VAC 60 cycle $60. All in brand new condx and with instrux books. Robert B. Hupper, K2PLD, 47 Willits Rd., Glen Cove, N. Y.

DELUXE Call Letters: engraved polished black phenolic laminate, 2½" white letters on 3½ x 14" x ⅛" beveled blank, $1.75P. P. J. Mudie, W8LWW, 3701 Germaine, Cleveland 9, Ohio.

AMATEUR Paradies vacation spot. Livingstone Lodge and log cabins, Mascoma Lake, Enfield, N. H. For couples and family groups, 100 acres, eleven buildings, main lodge, fine sandy swim beach, boats, sports, Dartmouth golf and tennis courts, churches. La Salette shrine nearby, fishing, 30th year. Amateur rig in lobby. Light housekeeping cabins. European plan, $20 per week up. Children half price. Literature. Al Q. Livingstone, W2QPN.

WESTERN Electric network and impedance matching transformer, 12 terminals. Will match transmitter-receiver to line. Supplies antiside tone. Cost government $11.20. Your cost, new, 2 for $1.00 postpaid. Ralph Villers, Box 1, Steubenville, Ohio.

WANTED: High quality military or commercial test equipment, receivers, transmitters, tubes, etc. Will pay cash or swap. Electronicraft, Box 399, Mt. Kisco, N. Y.

FOR Sale: *QST*, 1920 to 1936. Gepapa, North Grosvenordale, Conn.

MUST Sell new Elenco Commander linear amplifier. Never was on the air. Complete with tube and chimney. Will ship collect in U. S. A. $800 cash. No less. C. G. Clarke, K5HRJ, Box 535, Knox City, Texas.

CANADIANS. KWS-1 complete commercial grade power supply, $1250. VE2JS, Millar, 78 Dahlia Ave., Dorval, Quebec, Can.

JOHNSON KW with desk, in exc. condx, $1095. Lewis West, WØAIO, Wichita, Kansas.

COLORADO Ham Directory. Over 2000 amateurs cross indexed by call, name, QTH with phone numbers. 64-pages. $1.00 postpaid. Denver Radio Club, Box 356, Denver 1, Colo.

SELL: Viking II, SX-96, good condition. W1YOD, Roger Strickland, Strickland St., Portland, Conn.

PENETROX eliminates power-wasting corrosion from aluminum beams. Only $1.50 postpaid. Culbertson, W6TTY, 2515 Novato, Palos Verdes Estates, Calif.

VIKING Valiant, new condx, details on request. K8JIE, P.O. Box 113, Bay Village, Ohio.

304TL Brand new Elmac, in orig. box, $23.95. Mark Sternheimer, 3816 Hickory Rd., Richmond 25, Va.

10 MTR mobile combination 10W xmttr and converter, $24; Heath Q multiplier, $8; 10 Mtr converter, $10; 10 or 15 mtr. Preselector, $5. Postpaid USA. Bill Deane, 8831 Sovereign Rd., San Diego 11, Calif.

SALE HRO7, pwr supply and speaker, coils A,B,C,D and AC, 21 Mc. bandspread. In excellent condx, realigned by Douglas Laboratories. Gave me 170 countries. Asking $140. Prefer local sale. Hilton Long, Walpole St., Dover, Mass.

NC-125 with speaker, ST203A 10/mobile xmttr. In gud condx. Best offer. Phil Carsecna, 5442 Wayne, Phila.

SELL: 75A4 serial 4175, new condx, first $590 check. Terex Tribander, Mod. TB2E, used only 3 months, first $125 check. X-pressed collect. R. E. Gooch, 704 S. Scottsdale Rd., Scottsdale, Ariz.

TRADE Or Sell: 1 Johnson 10 HP outboard, in gud condx, tank-and-stand included, $130 or trade for NC-109 receiver, with speaker. A. Blettenberg, 5002 Hudson Ave., West New York, N. J.

COMPLETE Morrow mobile unit, two years old. Includes transmitter, receiver, speaker, two power supplies, whip antenna, coils, mikes. Also power supply RTS 600s. Rev. Luther Peterson, St. Charles, Minnesota.

SELL Station: RME-45 with xtal calibrator; 250W phone xmttr, final pair 812As, complete 60W bandswitching phone xmttr for driver. Home built, now on air. With work can be first-class rig. Make me an offer. W2PGF, 17 Coolidge St., Larchmont, N. Y.

HALLICRAFTERS S40, also new S53A. Will sell either at a sensible price. Blum, 396 E. Whittier St., Columbus 6, Ohio.

SELL: NC-300 1½ years old, with NC-300TS spkr, XCU-300 calibrator, all clean as new, with National 2 meter converter, $265 complete. W2ESO, Gene Black, 16 Marden Ave., Sea Cliff, Long Island, N. Y. Phone ORiole 6-9346.

RARE Back issues of *QST*: 1916 (Apr. Aug., Sept., Oct., Nov. and Dec.); 1917 (Jan., Feb., March, April, May, June, July, and Aug.); 1919 through 1958 complete, with 1919–1920 bound and 1921 through 1958 in binders. Sorry, cannot break up run. Must be sold intact. Best offer. J. J. DeSousa, Jr., FW1QK, 43 Joy St., Boston 14, Mass.

522 Trans. converted AC pwr supply, push-to-talk microphone 10–6-2, $25; Leece-Neville 6 volt 100 amp. alternator rectifier and harness, $25; TNS, $4; car radio, 1950 Mercury, like new, $10; Hoyt 6 volt battery condx indicating meter, $5. W8JAY, Leo Ailinger, 2577 Manchester Rd., Akron 19, Ohio.

WANTED: 75A-4, W1ASA

FOR Sale: Hallicrafters HT32A, HT33A, SX-101. In original cartons, never used. Real sacrifice. C. R. Peyton, Box 343, Marietta, Ohio.

FOR Sale: Central Electronics 20A Exciter with QT1, 458 VFO in deluxe cast, $200. W9RHE, 6920 N. Medford Ave., Chicago 46, Ill.

HALLICRAFTERS SX-99, new, sealed carton, $115. Gotten as prize. F.o.b. Port Washington, N. Y., Box 308.

FOR Sale: Hallicrafters SX-42, $235. Wanted: G-66 or Pierson Holt KE-93. K2QVH.

NEW 304TL, $10; used VX150A, $3.00; 715C, $1.00; 2BP1, $2.00; BC458 converted to 40 with 500V 200 Ma., 300V 150 Ma. pwr supply, $30. W1IOW, RFD #2, Norwich, Conn.

SX-62A, slightly used, perfect condx. Standard 90 day warranty, $300. Arcby Electronics, Hancock at Gray, Louisville, Ky.

ADVENTURER, Plate modulator, crystal mike, $60; WRL screen modulator, $6; Heath VFO, $15. Walter Steen, Woodstock, Conn.

PRESTO K10 Recorder, for microgroove and regular recording, 112 lines cut outside in or inside out, two speed 33⅓ and 78 RPM, 45 RPM adaptor. Has own amplifier; can be used as A. PA system. $185 or trade for good factory wire receiver. WV2CWB, 725 Irving Pace, Plainfield, N. J.

VIKING Ranger. Have new, unused Ranger at home in N. J. Built on return from Arctic. Not allowed to set rig up here. $180 shipped from N. J. Edward Eggert, 34th Air Div., Box 310, Kirtland AFB, New Mexico.

HEATH CO. Mohawk receiver, Apache transmitter and SB-10 Sideband Adapter. Used 30 hours. Best offer. Delivered anywhere in N. Y. state. K2HCD, Hilton, N. Y. Garl G. Thoresen, 35 Hazen St.

FOR Sale: Like new, Johnson Ranger, $190; Matchbox 275 watts, $27.50; B&W LP filter 52 ohms, $8.50; Johnson SWR Bridge 52 ohm, $6.00. J. R. Jeans, K2HQO, 101 Green Treet Rd., Clifton, N. J.

TRADE — Exacta CVIIA with f2.8 automatic lens, case, 3 closeup lenses, for communications rcvr. Preferably NC-183D or possibly SX-62A. A. R. Thomas, Box 1041, San Antonio, Texas.

SELL: Excellent Meissner Signal Shifter, bandswitching Mod. EX, $19; modulator for 120 watts with speech amplifier and power supplies on same chassis. Uses MultiMatch xfrmrs, $49; Converted PE101C dynamotor, $5.00; 6v Vibrator supply 300V at 100 Ma, $4.00. 25 watt modulator w/tubes and power supply, $15; BC-906 frequency meter, $6.00; Eldico 2-meter transmitter and receiver both for $30; Eldico Single Sideband Jr., $19; New Stancor transformer 2400 volts CT at 405 Ma., $19.50; Stancor 300 Ma swinging choke, $4.50; New Heathkit antenna impedance meter, $11.50; New Heathkit Q multiplier, $8.50; 100 Ke frequency standard, $7.00. Bernard Witherspoon, W8GKM, Washington C.H., Ohio.

JOHNSON Ranger, perfect condition, $165; NC-300 with xtal calibrator and speaker, like new, $275. K2UDB, 161 Crestline Drive, Syracuse, N. Y.

WANTED: 2 BC-611 Handie-Talkie cases, complete. W6HRZ, 754 Lakemuir Drive, Sunnyvale, Calif.

A Missionary group serving in the jungle of Peru was recently given a transmitter using 833s. If you have such tubes or know of the whereabouts of any please write Bob Lunday, W5FIL, 4417 Donnelly, Ft. Worth, Texas.

SELL: Viking I, 200 watts, TVI suppressed, Heathkit VFO, spare 4D32, wired for B&W, SS. Also HRO-7 with pwr supply and 7 coils. The works, $225. F. Trotta, 427 Mary St., Utica, N. Y.

SACRIFICE: 32VI including two spare 4D32s. Make offer. Wells Chapin, 942 Arden Lane, Birmingham, Michigan.

GLOBE SCOUT 680A xmtr. Globe 755A VFO, factory-wired and perfect. Bought in December. In orig. cartons. JT-30 mike, J-38 key; 100 ft. 72 ohm coax, 40 and 80 M Novice crystals. Ship c.o.d. $160. Bill Nelson, 701 W. Church, Berryville, Ark.

HQ140XA revr with calibrator. In perfect condx, looks new. $200. W3AGJ, 53 Shirley Road, Hatboro, Penna.

KEYS for Electronic Keyers, the new Elkey, attractive, precision made, 3½ x 5 in. black cast base, 3½ lbs., chrome finished solid brass construction, dual lucite paddles for minimum ambidexterous motion, silver contacts. A first, $15.50 prepaid in U.S. Card for details. Poucel Electronics, R. L. Poucel, W2AYJ, Box 181, Babylon, L. I., N. Y.

SONAR SRT 120, power supply, VFO, spare 5894A, 80–10 mtr., 100 watt phone. In A-1 condx, $89. K4GSR, 215 Dunn Drive, Montgomery 9, Ala.

RECEIVERS: Repaired and aligned by competent engineers using factory standard instruments. Authorized factory service station for Collins, Hallicrafters, Hammarlund, National, Globe, Harvey-Wells. Our twenty-second year. Douglas Instrument Laboratory, 176 Norfolk Ave., Boston 19, Mass.

SACRIFICE! RME 4350 recvr., $175. Better than better condx. W1FGF, c/o ARRL.

TORIODS: Uncased 88 mhy. like new. Dollar each. Five, $4.00. P. P. DaPaul Co., 101 Starview, San Francisco, Calif.

FOR Sale: Gonset 3–30, $25; Stancor ST-203A, $25; 6 volt dynamotor 425 v., 375 Ma., $10; 75 meter center loaded whip, $10. Prop pitch motor, $10. F.o.b. 11575 Manorwood Drive, Baton Rouge, La., W5IIS.

FOR Sale: Hallicrafters SX-25, $50. In gud condx. Instrux manual inc, first come, first served. Write: David Waycle, 57 Newington Rd., Elmwood 10, Conn.

SELL Pair brand new RF ammeters 0/5 amps. Ruggedized, MIL specs. First $4.00 takes them. Allen, Box 105, Flushing 54, L. I., N. Y.

WANTED Complete KW rig or parts to build. Interested in inquiries within 75 miles of Stamford. Need 805s modulator with power supply and r.f. final. K1DVO, Glenbrook, Conn.

RME 4300 receiver, in excellent condx, $135. Stanley Thayer, 3726 Bevan Rd., McKeesport, Penna.

COLLEGE Bound: Must sell DX-35, in exc. condx w/ sensitive D-104 mike. $50 wanted or highest bid over that amount. Contact K9OUX, 1122 St. Joseph, Gary, Ind.

SELL: DX-40 HT-18 VFO AT-3, 9 First Novice rocks. First $100 or better. Steve Mutchler, KØMIK, Aneta, N. D.

108 Mc converter, 7 Mc output, $15; Pwr supply, $5.00. F.o.b. W6RET, 8831 Sovereign Rd., San Diego 11, Calif.

NEED Gud xmtr, revr or Comm. 6. Will swap doubleneck electric steel guitar. Please write W2RPN, 809 Peach, Vineland, N. J.

WANTED: Collins 32V3, factory-built, no modifications from earlier models. Must be in A-1 condx. State lowest cash price. W3BLA, 1357 Hill St., York, Penna.

COLLINS 75A4, 3.1 and 1.5 filters, special IF in "C" position· speaker, #5090, like new, $650; HT-32, only 6 months, $550; Johnson KW SWR Bridge and Indicator, $25; BC-221, 110 AC, $40. All perfect and like new. Everything for $1200. W2SIK, 224A Rye Colony, Rye, N. Y. Tel. 7-5520.

SELL: National NC-183D with speaker, $275, DX-35 with antenna relay, $45; Q Multiplier, $7. All in A-1 condition, hardly used. K2TZB, Pleklo, 400 Brook St., Linden, N. J.

SX62A w/speaker, used 60 days, $329.50; SX-101, used three months, $299.50; Central Electronics slicer, Model B, like new, $59.95; P.E. 103 Dyn., brand new, $24.95; BC 459 on 20 meters, c.w. w/power supply, $25; 350 PS-1 pwr. supply, 110V to 240V AC input-600V DC at 1.5A output, $25. Kay Electric Mega Sweep w/Mega Marker. Best offer gets it. W4ODK.

CLEANING House! Best offer takes the following items: 42 ft. Alprodeo aluminum tower, 522 transceiver, Heathkit VFO, Viking Adventurer, new BC457, new BC459, new 829B, Weston #301 100 Ma. 200 Ma. Forty watt modulator. M. Kunzman, W2HWN, 723 Hillside Ave., Plainfield, N. J.

FOR Sale: RME 4300 recg. built-in Q mult., in exc. condx, $125.00. R. J. Melrose, 525 Carroll St., Waverly, Ohio.

FOR Sale: DX-20 excel. condx, $30. K2RGZ, Bob Yarmus, 532 Lefferts Ave., Brooklyn 25, N. Y.

FOR Sale: Hallicrafters HT-31 Linear amplifier, 300 watts P.E.P. SSB, $250. Mark Grossman, K2CON, 1665 Monroe Ave., Bronx 75, N. Y.

WANT DB23. Sell or trade: HQ- 00, DX-40, VF-1, BC-AS230 and 80 meter coil, big magnetic speakers, Metrodyne Super (made in '20s), 110 tubes, 25¢ each or $15. Key, K4MDF, Dahlonega, Ga.

NC-109 revr, w/manual, less spkr, $125. F.o.b. origin. K8JWC, Booker, 1908 Crestbrook Lane, Flint, Mich.

WANTED: SX-28 cabinet, in gud condx. KH6CRU, Hughes, 113 Kuulei Rd., Kailua, Oahu, Hawaii.

TOWER Wanted: used, 50 to 80 ft. steel tower of the crank-up type which will accommodate a Telrex triband beam and Ham-M rotator. Will be willing to pay shipping if within New York area. K2BLL, 57 Drum Hill Drive, Summit, N. J. Phone CR 3-0440.

EXCELLENT Buy: Eldico 100A SSB AM/CW with extra 5894: $330. S. Rand, 27 Forest Ave., Ossining, N. Y.

FOR Sale: SX-99, $119, F/W Ranger, $199; CDR AR-22 rotor (never used), with cable, $30; Gotham DeLuxe 15-M. beam with 50 ft. RG8U, $30. AC-1, $7.00. All are in excellent condition. Edward Miller, K6TVZ, Box 144, Calistoga, California.

FOR SALE Cush-Craft ATGP-3 Triband groundplane antenna, 10–15–20 meters, in gud condx, $20. J. T. Morey, W2HXF, 210 Mountain Ave., Princeton, N. J.

CLEANING out excess gear. 1 KW variable voltage transformer, 100 w. audio transformer, BC312N, 3–6MC and 6–9MC Aircraft receivers and odd tubes reasonable. Send for list. W2ASD, Buck, 32 Ardmore Terrace, Collingswood 7, N. J.

FOR Sale; Phone/C.W. rig, 300W, 20M 3-el Hy-Lite beam, prop pitch motor, spare parts, Sams Fotofact volumes 1–5. All for only $150. Will not ship. Must pick up. K6IDVU, ex-W2NMM, 90 Brookside Ave., Mount Vernon, N. Y. Tel. MO 8–8257. John A. Bertuch, Jr.

COLLINS 75A2 with matching speaker, perfect, $300; Viking Valiant, perfect, $315, both for $600. J. A. Baroiet, W3BUD, California, Md.

FOR Sale: NC-88 revr in perfect condx, $80; Globe Chief xmttr in perfect condx, $45. Or will sell both for $115. You pay postage. Larry Bailey, Box 443, Ripley, West Virginia.

HAVE Two, sell one, brand new KWM-1 and AC power supply never registered. Won in prize drawing: $750. W. P. Clarke, P.O. Box 1009, Waco, Texas.

LONGWAVE Receiver, Navy model RAK7; 15 to 600 Kc. Comprises CND-20131 regulated rectifier power unit, 110/120 volts, 60 cycles; CND-46155 receiver. Only slightly used. Excellent condition and appearance. Best reasonable offer takes it. Local only. Martin Bayer, 2 Grace Court, Brooklyn 1, N. Y. PHone MAin 5-3823.

COLLEGE Bound! DX-35 on 6 m. complete set of spare tubes and homebrew VFO — $40; QF-1, $5.00; Heath VP-12, $3; 20 mica capacitor .01 to .005 at 600 v. to 1200 v. $2. Will barter. W3JJU, 313 S. 31st St., Harrisburg, Penna.

WANTED: Collins 75A4, state condx and filters included. W1TF, Elmer Turner, 2 Virginia Circle, Reading, Mass.

FOR Sale: NC-300 w/XCU xtal calib., 6 months old. First $275 check accepted. Central Electronics 20A S.S.B. exciter w/458VFO Globe linear final, Mod. LA-1, first $325, all new condx. W20FM 1300 Second Ave., Asbury Park, N. J.

BARGAINS. Reconditioned and guaranteed. Shipped on approval. Easy terms available. National NC98 $99.00; NC125 $99.00, NC183D $249.00, NC300 $279.00, HROs: Hallicrafters S38 $29.00, SX99 $119.00, SX96 $159.00, HT32 $479.00, S40A, S40B, 885, SX71, SX100, SX101; Hammarlund HQ100, HQ110, HQ129, HQ140, HQ150, HQ160, HQ170; Collins 751A, 75A2, 75A3, 75A4, 32V3; Central 10B, 20A, 600L; Heath DX35, DX40, DX100; Johnson Ranger, Viking II, Valiant, Thunderbolt; Elmac; Globe; Gonset; much other equipment. Write for list. Henry Radio, Butler, Mo.

FOR Sale: RME 4350, Globe Scout 680, Heath VFO, JT-30 mike, Dow-Key relay, brass key, headphones. On air only 67 hours. All in absolutely perfect condition. First $310 takes. I will ship. Shupe K3EEZ, 218 Greenlee Road, Pittsburg 27, Penna.

SELL: Leece-Neville 6-volt system, $40; 10–20–75 meter Gonset converter plus suppressors, $20; complete 80 M Master Mobile whip, $15. William H. Tucker, W3EWX, 425 South Allen, State College, Penna.

KWM-1, mobile, and fixed power supplies, mobile mounting tray, Mark Hellwhip 3-band antenna, deluxe Master Mobile mount, model 505K Shure mic, all like new and in perfect working condition, $1200. Getting married! Carl Stiller, K9AGW, 240 Fredrick St., Menasha, Wisc.

SAVE On Electronic, Radio and Communication Components and equipment for Ham and commercial use. See thousands of parts in stock — many more coming in daily — too numerous to catalog, all at unusual savings. If you live in or near Philadelphia, visit our new warehouse, Selectronics, 1206 S. Napa St., (at 31st and Grays Ferry), Philadelphia 46, Penna., or phone HOward 8-4645.

FOR Sale: DX-100 in good condition, modified keying, push-to-talk, extra heavy pi-network, w/D-104 mike and G-stand. Only $200 F.o.b, KC or St. L, Mo. Prefer sale in one of these areas. Write: Steve Pakula, KØBIB, 7561 Oxford Dr., Clayton 5, Mo.

COMPLETE Station for sale. All new equipment January 1959: Collins 75-A4 revr, Serial 5590 with matching Collins speaker and 3.1 kc., 800 cycle, 6 kc and 2.3 kc filters. Globe Champion 300A transmitter, factory wired, Astatic D-104 mike, Novice crystals, WRL Model AT-4 antenna tuner; 48 ft. Globe Anchor Spire Tower, never used, with 3 element Tribander antenna and all necessary cables. East Coast Rot-Brake with wall map indicator, never used. Miscellaneous tools and cables go with it. Inspect and take it away, all for $1,000. John R. Slattery, WV2DMD, 14 Crescent Drive, Whippany, N. J. Tel. TUcker 7-2058.

SELL Leeco 10 m. ground plane antenna complete with aluminum tubing radials and coax fitting. Pick up. $10. Also, British Shortwave Magazine (Amateur Radio). January 1950 to date. Offers? O'Brien, W2EQS, 48 Prospect, Westwood, N. J.

COLLINS 32V3 with low pass filter and antenna relay: $395; 3-element 20 meter shortbeam: $25; Lysco 10 meter vertical ground plane, $12. E. C. Manning, W5GFO, 2302 N. Main, phone MA 4-8453, Ft. Worth, Texas.

WANTED: Hallicrafters S-27B (36–165 Mcs. AM/FM) Conrard, 418 Four Mile Road, Racine, Wisc.

FOR Sale: 500 watt 813 amplifier homebrew with 811s modulator and power supply. Bandmaster Senior with VFO as exciter; all for $100. William Yanney, 3372E, Nelson Courts, Fort Dix, N. J.

FREE: Heathkit VF1 with purchase of exc. Globe Scout 680. K2-VDJ, D. Alberts, 166 E. 92nd St., N. Y. C.

HT32 Hallicrafters, like new, maybe 10 hours operation, $500; also 75A2, 100 Kc marker. A good one, $275. Consider offer for package. K4ZBW, 905 No. Island Dr., N.W., Atlanta 5, Ga.

SALE: HQ-110, used only few hours, $180. Ditmer, 2233 Cypress St., Wantagh, N. Y.

SELL: 810 Class B Modulator, $500; 2000V power supply, $70; rack, $35. Landfield, 821 Waveland Rd., Lake Forest, Ill.

FOR Sale: Unmodified DX-100, in fine condx, with manual, $170; SX-17 revr, $50. If interested, make a reasonable offer. Want: SX-62. Fred Madden, W8PFW, DeGraff, Ohio.

WANTED: Beg, borrow or buy. Urgently need technical manual or info on Collins 51J-3. W9FKZ, 217 Hayes Ave., Northlake, Ill.

COMPLETE — RST system — Abbreviations for CW work — A.R.R.L. Terms — Prefixes — Special Q signals for net use. Complete Q signals. Printed two sides 11x17 Index stock. This handy aid ready to hang in your shack. P.P. 25¢. Outside U.S. 35¢. W. S. Harold, W2PQJ/4, 341 6th St., Holly Hill, Florida.

500 W. Motorola xmtr; 2–6 ft. racks, 80–10 meters, remote contx unit plus Unidyn. 55-C mic. plus Meissner sig. shifter. In perfect condx. $1600. New. Make offer. Bruce Carlson, KØEEC, 4243 Harriet Ave. So., Minneapolis, Minn.

ELDICO TRI TV 300 watt transmitter, $200; Meissner EX sig. shftr, band switching, screen for TVI with NBFM phone unit, $40, both: $230. Viking mobile transmitter, $65; Viking VFO $20; both for $75; SCR-522 recvr in cabinet with pwr. supply, $25; Dumont 3″ 'scope, $15; PE103, no base, $8; SX-24 recvr with spk, $65; RCA Hi Frequency sweep generator, type 709B, no pwr. supply, $30; Elco Model 320 signal generator, $15; S-38, $25; Navy test unit TS-182/UP, has 2″ 'scope, 115V pwr. supply. All cables, $35. All F.o.b. Cana, Virginia. Lonnie M. Utt, W4FNH.

FOR Sale: Complete station: DX-100B transmitter; NC-183 receiver, both in perfect condx, antenna relay included. All for $350. K7BIF, 1026 N. Catalina Boulevard, Tuscon, Ariz.

ALUMINUM for every ham need! Write to Dick's, 62 Cherry Ave, Tiffin, Ohio, for list of tubing, angle, channel, castings, plain and perforated sheet and complete beam kits.

3 Element Hy-Gain Mini-Tribander, perfect, $35. F.o.b. Warren, Ohio. Jack C. Hilton, W8RQL, Box 206.

BACK Issues QST-CQ bought, sold. Tagan, Radio Co-op, Box 5938, Kansas City 11, Mo.

TRADE For amateur radio xmttr and/or recvr, prefer xmttr. Camera: Contax IIa w/50 mm f/2 and Nikkor 135 mm f/3.5 lens, leather carrying bag, with assorted filters. ASSGT, Chuck Tyshko, Hq Co. H & S Bn, Parris Island, So. Carolina.

ATTENTION Paraguay ZP's using SSB. Will listen week-ends at 8:00 AM CST on 14,300 Kc and operate on 14,297 Kc from WØCVU. Will send hamshack souvenir for QSO.

RECONDITIONED Equipment: New Guarantee: Mobile the inexpensive WRL way! Super-6 $39.50; Super-12 $54.95; G-66 $149.00 Communicators $125.00 up; TBS50's (specify low or high impedance microphone) $59.95; Viking Mobile $79.50; MBR-5 $139.00; MB560 $139.00; A54H $95.00; AF67 $139.00; PMR6A $79.00; PMR7 $119.00; ATC-1 $59.50; MC-55 $38.50; SRT-120 $89.00; power supplies $5.00 up. TONS of fixed station equipment! 75A1 $265.00; 840 $65.00; SX62 $179.00; SX100 $219.00; SX101 $319.00; HQ140X $179.95; HRO60T $385.00; NC98 $114.00; NC125 $139.50; NC300 $269.00; many speakers, slicers, calibrators etc.; inquire. Also have HUNDREDS of transmitters. Terms, trials, trades. Leo-WØGFQ. WRL, Box 811, Council Bluffs, Iowa.

FOR Sale: HQ-140X receiver; DB-23 Preselector, Heathkit Q-Multiplier. K2MMF, Mike Glass, 1122 Kenyon Ave., Plainfield, N. J.

LEICA IIIg, f/2 Summicron lens, Weston Master III, Hershey strobe unit with extensions, Bausch & Lomb projector and screen, etc. Will swap for gud clean 32V2/3 xmttr. Wm. J. Garrett, 1021 East Scottwood Ave., Flint 7, Michigan.

75A2 with calibrator, NBFM adapter, manual, $325; Hammarlund HC-10 SSB converter, $95; both for $140; Johnson VFO factory-wired, $35; RME DB-23 Preselector, $25; Gonset Superceiver and Super Six converter 12 v., $80. All above in exc. condx. Original owner. Ship collect or call. Also PE-103 dynamotor, $12. Other mobile equip. K2CR, 12 Overbrook Rd., Upper Saddle River, N. J. Tel. DAvis 7-2208.

VIKING II, excellent condition, instructions, $180. K9ALP, Louis Arnold, 444 Gilbert Ave., Eau Claire, Wisconsin. Tel TE 5-9887.

WANTED: Instruction manual for Hickok 540 Tube Tester. Will buy or lease for photocopy. Donald Halford, W9VJD, 5632 Maryland, Chicago 37, Ill. Tel. NO 7-4959.

FOR Sale: Viking Mobile with VFO, $95; less VFO, $75; Viking Matchbox, $40; Viking II with Viking VFO, $195; Viking Thunderbolt, $415.00; NC-173 with Heathkit, "Q" mult., $129.95; HQ-129X, $129; NC-300, $295; NC-66 (new), $90; B&W SSB receiving adapter (new), $94.50; RME 4350 with speaker, $199.95; HR 2-607T1, $295.00; 99-A, $200; Elmac AF-67, $125; Elmac PMR-6A with P8R-6 pwr. supp., $99.95; Heathkit DX-40, $49.95. Brown Electronics, Inc., Art Brown, W9IHZ, 1032 Broadway, Ft. Wayne, Ind.

SELL: DX-20 with low pass filter and Monimatch, $45; Int'l Crystal 6M converter with preamp. tubes, Minibox and xtal, never used, $25; Heath SB-10 sideband exciter, $100; Hearh GDO, $25 and SB-10 and GDO built April 1959. Prefer local pick-up deal. Carrol A. Wilson, K8EOP, 146 E. Henry, Adrian, Mich.

WANTED: Radio gear of the 1920s: UV206 1 KW tube, Remler Infradyne, untuned R.F. transformers made by Acme, All-American, Atwater-Kent, Branston, Dongan, Dubilier, DX, Erla, Federal, Marie, Miller, Mu-Rad, Rasla, Savannah, Sterling, etc. Buy, borrow or trade. Grote Reber, Green Bank, West Virginia.

SALE: Collins 32V3, $450; Simpson Tube Tester, #555, $25; Eldico Antennascope, $5; Mrs. Harry Broadley, Dana Place, Needham, Mass. Tel. HI 4-7737.

FOR Sale or swap: Stephans Hi-Fi coaxial speaker, 15″ 102 J, new "Gothard" 500 watt converter, 115 De to AC 60 cycle continuous duty, PE-103A converter, Leece-Neville alternator, 6 volts, "Wisconsin gasoline engine, 6 hp 4 cycle, brand new; Palomar, Jr., 4½″ reflector Telescope tripod and lenses to 270 power, base, whip and all-band mobile antenna. Interested in Tri-band antenna with rotator. Edw. B. Schofield. 30 Lee St., Woodstown, N. J. W2YYO.

COMBO HT32, HT33A, $1100; KWS-1, $1375. Write for an excellent list of good buys. Wanted, an "H and R Handygun". This is a single shot target pistol with a 12-in. barrel. Will swap. W2ADD.

COLLINS 75A4 with 3.1 Kc and 500 CPS filters and matching speaker. Like new condx, $600; also Perfect DX-100, $175. Henry Koert, 2 Chadwick St., Paterson 3, N. J. Tel. ARmory 4-7299.

HEATHKIT Transmitters wired and tested. Too busy to assemble your Heathkit transmitter? Will wire, test and work DX before shipment. DX-40, $30; DX-100-B, $65; Apache, $80. Send kit to me from factory. I will pay postage from Benton Harbor. Inquiries invited. K4SVR, Roy V. Harris, 1908 16th Ave. South, Birmingham 5, Ala.

WANT 75A2 or 75A3. Must be in excellent conidtion. State cash price. Bob Miller, Boardman, Oregon. Phone HUnter 1-2161.

VIKING Valiant, new, 2 hours use only. $350. Sry, will not ship. Donald Mack, K8BOX.

COLLINS KWM-1, complete AC, DC, supply; Mobile Mount, mint condx. Will swap for HT32 Collins 75A4 combination or late model Volkswagon. K2IQZ, Joseph DiLiberti, 1281 Plaza, Secaucus, N. J.

COLLINS KWM-1 Ser. 613, 14 hrs. use; Collins A.C. and D.C. supply, mobile tray cables, uncut, 3 band Hellwhip. First bank check $895. Collins KWM-1, mint condx, supply, swap for HT32 Collins 75A4 combination or late model Volkswagon. K2IQZ, J. DiLiberti, 206 Central Ave., Murray Hill, N. J.

COOL California Kilowatt final and 810 modulator; two 2000 volt volt amp. supplies plus regulated bias, de-TVI'd complete with five meters and vertical rack mounting, 8000s can be driven with ARC-5, DX-100, 32V, Viking II, etc. Free delivery within 150 miles of San Francisco, no crating. Write for pictures and simplified schematics: $219.50. K6HVQ, 2019 Mira Vista, El Cerrito, Calif.

SELL NC-98 with Heathkit QF-1, excellent condx, $100. K8KPJ, Ron, 8519 Hendrie, Huntington Woods, Mich.

KWS-1, perfect. Phone or write for unbeatable cash deal if serious about buying this fine rig. Robert Lewin, 28 Fenimore Dr., Harrison, N. Y. Rye Rye 7-3733.

WANTED: 75A4 in exc. condx. Prefer complete with 3.1, 2.1 and 800 cycle filters and matching speaker. Will consider others. Please describe fully giving all details as serial number, speaker and type tuning knob, filters included, modifications and external appearance. All letters answered. Send details and asking price to Joe Galeski, W4IMP, Box 658, Richmond 5, Va.

HEATH AR-3 recvr and QF-1, Q multiplier. Less than year old and in good condx. $25. Now proud owner of HRO. Eugene Blundy. K9ONG, 712 Breen Drive, Champaign, Ill.

GLOBE-KING 400B, with VFO. Nice condition. Pick up. $230. W5AK.

SELL: 2 Meter Communicator, 6-11OV. Exc. condx. $195. Express prepaid. W7WYV.

SELL: Local only. Clean 75A1-195, 75A2-275, BC454-10, pwr. 10, BC 458A-8, BC 459A conv.-10, its husky supply-15, BC696A with 3″ sq on panel -15 Hy. 69 trans. conv. 6146 final, p.p. 6L6s, mod. -60, Millen Grid Dip and coils, 35, 4-2″ sq. Westons 0–100 Ma., new, 4 each, West. sq. 3″ 0–15 mils. -4, 2 West. sq. 3″ 0–3 RF amps, 4 each; Thord. xfrmr 1290–0–1290, 600 Ma. -20 dynamotor, unused, 6 in., out 425 v., 375 ma., -8, UTC input LS 19–10, LS57 output-10, 6 new Natl. Vernier N dials — 3 ea. Grommes Hi-Fi amp, DB23, like new, -30, 25, Q5'er; -10, all above clean W2GKP. Tel. PL 5-1122.

SELLING Out! Complete station, like new, DX-100, $175. Excellent SX-43 with R-42 spkr, $100. KØ APZ, R2-5, Pukwana, S. Dak.

KWM-1 for sale, new condx, ser. 752, $600. W9PQO, 937 Lombardy Dr., South Bend 19, Ind. AT 7-0939

75A4, speaker, calibrator, vernier, just like new. Don't confuse a 75A4 with a 75S1. There's a difference. This 75A4 is worth more than $595. Glen Byars, Box 105, Kearney, Nebraska.

SHOP Experimental equipment from old radio: variable-regulated power supply; code practice oscillator, audio oscillator, signal tracer, 12 circuits, $1.00. Whitener, Box 4384, Austin 51, Texas.

SAVE 50% genuine RG11 cable, new, 200 ft. lengths with PL259 on either end, $16. Gizmos & Such, Still River, Mass.

FOR Sale: HT30, Mark I, exc. condition, $300. W9CRP, H. C. Stamate, Box 76, Leesburg, Ind.

SERVICE: Popular brand electronic kits wired, tested and calibrated by first-class technician. Inquiries invited. No obligation. Fincher Electronics, Lennox, So. Dakota.

HAMS! Learn Calculus. Powerful mathematical tool. Easy practical lessons. First four $1.00. Matheo, 4256-2 Minmor, Cincinnati 17, Ohio.

SELL: National NC-125 receiver $40. Price includes matching speaker and NBFM adapter. Instrument is very clean and in gud wkg condx. Belonged to SWL friend and used comparatively little. Check to Dr. C. R. Crosby, W1QP, RFD Chatham, Mass. You pay transportation.

COLLINS 75A4, perfect, just like new, late serial number, 3.1 Kc and 6 Kc filters, matching speaker, $675. W5DYS, Paul Dudley, Trumann, Ark.

FOR Sale: Pair RCA model CMV-1A mobile FM transmitter-receiver; xtal controlled, presently 160.0 Mc, 2E26 final, suitable 6-12V dc. brand new, less cables, control box. $125 ea or will swap DX-100 for one. K8JMC. 7392 Pearl Rd., Cleveland 30, Ohio.

WANTED: S-36 Hallicrafters in exc. condx. Selling HFS National 27-250 Mc. AM-FM-CW recvr, $80. Robert Ireland, Pleasant Valley, N. Y.

E. E. G. 2-channel electroencephalograph, old but gud wkg order, $280. Scott 310-B FM tuner, new condx, $150; Collins 70E-8A precision tuned oscillator (VFO), new, $95; Heath MM-1 Multimeter (20Kohm/volt) good, $23; old crank-operated Instructograph w/10 tapes, $12; 10th Edt. Hornung Radio Q & A, $2; all postpaid in continental U. S. A. from J. K. Green, W6MMC/7, Box 412, Sedona, Ark.

WANTED: SX-62A receiver. In A-1 condition. Leslie H. Noakes, Glenwood Ave., Middlebury, Conn.

SELL: Heath DX-40 VF-1, AT-1, Hallicrafters S-85. All excellent condx. Bentley Adams, Jr., K8KVV, RFD 1, Three Oaks, Mich.

SELL: Globe King 400B, 10–20–40–80 meter coils, World VFO, extra pair V7ODs, 5514s, vy gud condx. Express collect, $165. W9RQR, 204 So. 11th St., Belleville, Ill.

BEAM: Hy-Gain, 3-el., 15-M, $22; Knight VFO, $15; WRL screen modulator, $9; baluns, $6.50. Gud condx. F.o.b. Piedmont, Ala. Loftin, K4RJM.

GLOBE King 400C with factory push-to-talk and speech clipper, with coils for 75, 20, 15, 10M. Heathkit VFO, plus crating or deliver to 300 miles rad., $325. Central Elecnes 10B exciter constructed from kit and factory aligned April 1959 with 80 and 20M coils in orig. carton, BC458 VFO w/factory 160-15M, not in deluxe case. Manuals with all equipment. $115. Wayne H. Soltwedel, WØZVH, Wilmington, Ill.

WANTED Elmac AF67, other mobile equipment. Have SX71 for sale, make offer. Heathkit WA-P2 and W4-AM, $30. W2YCS, Ridgewood, N. J.

SALE: Complete RTTY station: Model 26 printer and 26A table, including two power supplies and 255A relays, for printer magnet and oscillator keying, $85; WØHZR 'scope tuning indicator, $32; W2JAV terminal unit, $65. All units in excellent condx. No shipping of printer or table, sry. W1SUQ.

WANTED: 12V DC power supply and mobile installation kit for KWM-1. B. Strem, 222 W. Gardner, Long Beach 5, Calif.

FOR Sale: Heath AR-3 receiver with Q-multiplier used 3 months, perfect, $37.50; Hallicrafters S-76 double conversion receiver and matching speaker, $115; Globe Scout 680A xmttr 3 mos used, $87.50. K7DSK, 411 7th Ave., Cheyenne, Wyoming.

TECH Manuals: BC603, BC604, BC1335, BC1306, BC191, BC367, AN/PRC-6, SX-28, $2.00 ea. Postpaid. Schematics only for above, $1.00 each. Operating instructions manuals for ARC-12, ARC-27 ARC-55 $5.00 each. Thousands of manuals in stock, send self-addressed envelope for free listing. T-26 chest-mike with F-1 button, new, $1.25; 5 for $5.00. Kit of good usable parts, no junk, $3.95. Lee Industrial Surplus, 28180 Van Born, Inkster, Mich.

FREE Ham Information, Interchange Center. Wants, offers, parts, projects filed, creatively correlated. Available information immediately mailed with reciprocator's address. Help grow hams' good possibilities. Enclose stamped envelope. K2KGU, Box 5-D, 420 Riverside Dr., N. Y. 25, N. Y.

TUBES brand new 4-65A's $9.50, 4-125A's $15, 4-400A's $37.50, 5-125B/4E27A $18, 250TH $15, 304TL $13.50, 4X250B $32, 4D32 $22.50, 810 $9, 811 $3, 813 $8.50, 814 $3, 815 $3.50, 829B $6.50, 830 $3.50, 832A $4.75, 866A $1.50, 75TL $12, and others. Collins 51J3 receivers, mint condition $750, BC-342 $60, BC-348 $75. BC-221 with AC supply, Calibration Book $65, Command Receivers 190 — 550kc $12, 520 — 1500kc $16, 3-6mc $8, 6-9. 1mc $8, Tuning Knobs 50¢, Command Transmitters 3-4 mc, 4-5.3mc, 5.3-7mc, $6.50 each. 7-9.1 $10, MD-7 Modulators $5.50. BC-AH-229 receivers $12, BC-AH-230 Transmitters $10, FL-8 Filters. C.O.D.'s ok. Bill Siep Company, Box 178, Ellenton, Florida.

SELLING NC-98, without speaker, no modifications, exceptionally clean, stable, $90 F.o.b. Want: UTC S-49, S-37, S-38, G, H, J, AB coils for HRO-50, 6 ft. enclosed rack. W2DXI.

KNIGHT, Ocean Hopper, all coils, $15; Heathkit Q-Multiplier, $10; Reyco Multiband traps worth $12.50 for $7.00 A-1 condx. Write to K1DLM, 127 Field Great Rd., New Canaan, Conn.

SELL: Viking II, coax relay, Bud low pass, $210; SM-90, $10; Need money for college. W6UQC, Joel Seidman, 3731 Tracy St. Los Angeles, Calif. Tel. NO 2-7965.

FOR Sale: SX-99 revr, gud condx, $100; K6YXB, Jon, 124 No. Whittier Ave., Whittier, Calif. Tel. OX-4-4148.

FOR Sale: Complete Novice, General station, HQ-145, DX-35 VF-1 and accessories, $200. Richard Maley, W1ZUH, Southboro, Mass.

STILL some items left! BC-375, $30; PE-103A, $20; Globe VHF-62 transmitter (factory-wired), new, $100; WU type 2B teletype (uses ½" tape) works OK. Make me an offer; Collins 75 S-1 receiver (just returned from factory with new dial) less than a month old, $425. Many misc. items. You pay shipping. R. D. Corbett, W1JJL, 46 Prospect St., Torrington, Conn.

JOHNSON Viking "500", appearance and performance, absolutely like new. Factory wired, 4-400A final, only $595 for quick sale. Also like new, NC-300 in original carton, with XCU crystal calibrator, $275. Bob, 48 Thatcher Ave., Buffalo 15, N. Y.

FOR Sale: CushCraft 20-meter ground plane, $10; Hy-Gain 3-element 15-meter beam, $20; 3" meters, $2.75 each, 0-15 Ma, 0-50 Ma, 0-150 Ma, 0-300 Ma, $3.75 each; 0-1 Ma., 0-750V DC, ARC-5 3-4 Mc trans. with tubes and crystal $7.00; tubes 6-816s, $1.25; 1-832, $2.50; 1-250TH, $18; 1-4-125A, $18; Var. cond. 80 $\mu\mu$fd, 4500V dc, $3.50. Stamp for misc. parts, all plus postage. Al Rae, 5 Oakbrook Rd., Ossining, N. Y.

SILVER Anniversary Hamfest of Hamfesters Radio Club will be held Sunday, August 9, 1959, at Santa Fe Park, near Chicago. See July QST Hamfest Calendar or write Betty Sandberg, W9STR, 2957 N. Monitor Ave., Chicago 34, Ill.

NATIONAL 183D like new; sacrifice $250. Gustave Lawrence, 67-12 Yellowstone Blvd., Forest Hills, L. I., N. Y. Tel. TW 6-9256.

SELL: LA-1 linear, $80; DQ- Q-multiplier, $20. W3DVX, 65 N. Church St., Carbondale, Penna.

FOR Sale: Hickok 610-A signal generator, used 25 hours, in exc. condx. Best offer over $125. Mark Dorinson, 1746 Idlewild Lane, Homewood, Ill.

SELLING out second station — HQ170-C latest model $265. KWM-1 with AC supply like new $650. B & W 5100 transmitter, perfect condition $260. H. P. Westler, 3125 Barney Avenue, Menlo Park, California.

FOR Sale: Mackay 167BY 900 W c.w. xmttr. Parallel 813s pi-net final; xtal and VFO, 80 thru 15 meters. Includes 2200 V 500 Ma. pwr. supply. $200. Byron E. Fortner, W9FYM, RFD #10, Box 486, Indianapolis 19, Ind.

SELL: Meissner 150B phone/c.w. xmttr. Minus Mod. xfrmr. Complete with Meissner Signal Shifter, both in gud condx. First check over $95 takes all! K1HHX, 138 Pine Street, Portland, Me.

WANTED: 75A4 or SX-101. State price and condx. For sale: 2QA with QF1, like new, perfect, $180. 50 cycle 1 kw 220 volt constant voltage transformer. Make offer. W2LXD, 1381 Richmond Court, East Meadow, L. I., N. Y.

PROFESSIONALLY Wired Apache, $250; brand new Eico #720 transmitter, $95; both perfect. Donald Wilson, West Marshall Drive, RD #1. Poughkeepsie, N. Y.

FOR Sale or trade: rig built, surplus gear to sell or trade: Dumont oscilloscope, 175A; BC191-N xmttr; Dynamotor, 14V DC, 1000V DC; RCA beat oscillator #152, other junk. Want: gud record player. L. O. Van Blaricom, 240 Pendleton Rd., Clemenson, S. C. KN4DNY.

GONSET Owners. Rack for mounting Communicator I, II, or III over transmission hump. Just the right position for convenient operation. No bolts or adjustment, in and out in seconds. $4.50 shipping weight 4 lbs. Strid Electronics, 234 Washington St., North Easton, Mass.

FOR Sale or trade: 450TL 20 meter kilowatt amplifier, $50; BC-453 QSer, converted, with AC power supply, $10; 50 Kc. xtal calibrator, self-contained, $8; Lynmar TR switch, $8. Marion A. Wise, W4PRO, 15 Willow Rd., Hampton, Va.

WANTED: 75A4 receiver. Send serial No., price, condition and other details. Will answer all mail. C. J. Kucyn, W2BTP, 34 Dumbarton Drive, Huntington, L. I., N. Y.

LATEST Amateur equipment: factory fresh, sealed cartons. Self-addressed stamped envelope for equipment you desire. H D H Sales Company, 919 High Ridge Road, Stamford, Conn.

HOOSIER Hamfest! The Indiana Radio Club Council will hold its annual "Hoosier Hamfest" as the Lake County Fairgrounds in Crown Point, Ind., on Sunday, July 19; 10 A.M. to 5 P.M. Donation: $1.50 Al Walters, W9NMO, 6819 Osborn Ave., Hammond, Ind. See Hamfest calendar.

SELLING Out completely: Hammarlund Super Pro BC-779, $75; Hallicrafters HT-9 Colls 80-10, gud condx, $90; Globe Scout 65-A bandswitching 160-10, (65W.), $45; Heathkit VFO, $7; Gonset Super Six, Gonset Noise Clipper, $30. Darryle Kransteuber, 6713 Brookside, Cleveland 31, Ohio.

FIFTH Annual York County Hamfest, August 23, 1959. Contact John Zett, W3FLD, 2740 Grandview Ave., York, Penna.

SALE: Homebrew pair 807s final pair 807s modulator, built-in VFO bandswitching, 40 thru 10 M., 150 W phone, 200 W. C. W. $140 Julius Countess, K2VYD, 64-04 217th St., Bayside 64, L. I., N. Y.

GLOBE KING 500C, like new, less than ten hours use. Guaranteed perfect. $595.00 for quick sale. Dave Rawley, 1002 Johnson St., High Point, N. C.

CANADIANS: Sell Marconi fone/c.w. cool KW, PP304TH, Class B mod. PP805s with KW Johnson Matchbox and bridge. Two extra 304TH and 805, $300. VE2APR, 33 Brooks, Sherbrooke, Que, P. Canada.

ARC-5 BC-454 (3-6 Mc.), BC-455 (6-9.1 Mc), both excellent, $7.00 each; NC-300, mint condition, best offer. Going VHF, 2 brand new boxed 4-400A, $35 each, both $65. brand new boxed 4-250A, $25. Dave Bernays, K4UWX, Box 2086, Pine Castle, Fla.

HALLICRAFTERS S-86 revr for sale. With "S" meter and "Q" multiplier. Used only one year and in excellent condition. Larry Conklin, WV2EGQ, 135 Meadow Lane, Kenmore, N. Y.

COMPLETE Mobile rig; Elmac AF-67; 115 volt power supply with connecting cord; Dynamotor, Morrow 5BR-2 converter; 10-meter whip and mount. $260. W3FWN, Sebring, Mt. Bethel, Penna.

FOR Sale: Globe King 500C, $450.00; Pacemaker, $335.00, 32V3 — $450. Harold Eskin, W2PVK, Rochester, N. Y.

SELLING Out! Send for list. W9OMH. Grothen, RFD #2, Box 10, Hastings, Nebraska.

FOR Sale: Very nice National NC-2-40D with speaker, $150. W8SWN, John Jellema, Zeeland, Mich.

FOR Sale: Globe Chief 90A, gud condx, 1 year old, $50; Heath VFO, $15; power supply 150 and 400 V at 100 Ma., $10; 4 bandpass filters 40-10 meters, $2.00 each; sell lot for $75. R. Tyson, 2752 Windsor Dr., Cornwells Heights, Penna. (new Philly).

SELL: Elmac A54 factory converted for 15 meters and for crystal mike. Vy gud condx. Asking $80. K2POE, 1152 Park Ave., Vineland, N. J.

FOR Sale PP-813-807 buffer amplifier, $100; KW mod. xfrmr with screen winding, $25; Elco VTVM $20; PE-103, $10; 1800V-400 mil pwr supp., $50; 15 amp var. auto xfrmr, $15. W5BUV.

SELL: DX-35, works on all bands fone and c.w. Fine condx, $50. Randy Bailey, K5KNR, Box 830, Huntsville, Texas.

KWM-1, 12v. D.C. pwr supply, mobile mount, custom A.C. pwr. supply, 10-15-20, helical whips; $850; H.T.32 trans., like new, $400, mfd. by Collins, 3.1 mech. filter for HRO or SP-400 revrs, plug-in, no changes to make, $30; 1 pr. of 250THs, brand new, $15; 4 Pyramol oil condensers, 2 μfd at 4000 volts ea. $3.50; National 1-10 revr, all coils, a.c. pwr supp. in fair condx $15. W9EUY, 7129 W. Farragut Ave., Chicago 31, Ill.

FOR Sale: Perfect KWS-1, complete with all cables, coax relay, speed dial knobs, latest model. W2ZOL.

FOR Sale: Knight-kit receiver, $95; Heathkit VFO, $15; both $105. f.o.b. South Hadley, Mass. Fine condx. Going Heathkit mobile. Dick Kirkpatrick, W1FSJ, South Hadley, Mass.

FOR Sale: "Z" match in like-new condx. 500 watts, Dummy ant.; Jones micromatch; Antenna tuning unit self-contained. $60. FOB. Joseph F. Dineen, W1JS8, 9 Winter Terrace, Westwood, Mass.

FOR Sale: Complete station: DX-20, S20R, xtals, key, $70 takes it. All in perfect condx. Will not ship, sry. Write WV2AMZ, Mike McHugh, 114 West Beard Ave., Syracuse, N. Y.

FOR Sale: Complete station consisting of NC 300, calibrator, spkr, Globe Scout 65B, seven crystals, balun coils, Dow-Key coax relay, Vibroplex "Goldplated" key, Shure 556 dynamic mike, 15 mtr. beam, office desk (wood, slope front console desk top, fine for shack). Will be willing to deliver within 200 miles. $500. KN9ORK, "Sparky", 220 East Grant, Macomb, Ill.

WE Pay cash for receivers and transmitters. Treger, W9IVJ, 2023 N. Harlem Ave., TUxedo 9-6430, Chicago 35, Ill.

WILL Trade 6 volt pwr. supply for Gonset Communicator for 12 volt supply for mobile operation. Write "Stu", WA2BAS, 291 Willard Ave., Staten Island 14, N. Y.

FOR Sale: Handbook 500 watt multiband transmitter. Neutralized and TVI suppressed. Two cooling fans. Extra 813 included. Specified parts used with no substitutions. $125. Par-Metal rack cabinet for above, $20. Both F.o.b. Belvidered. Larry Kleber, K9LKA, Belvidere, Ill.

FOR Sale: IBM Electric mill, $85; Pentron T-90 "Pacemaker" tape recorder, $75; Wagner-Nichols disc recorder, $50; Webcor record-changer, GE-RPX-050A cartridge, $15; Shure 737A mike, $15; K&E log Decitreg slide rule, $15. V. R. Hein, 418 Gregory St., Rockford, Ill.

SELL: Gonset 6M Communicator III, like new, 6 months old w/xtals and halo, best offer over $220; Tecraft 6M transmitter, $35, BC653 xmttr, 2-4.5 Mc., 80 watts, less tubes, only $15. Send stamp for list of surplus transmitters meters, xfmrs, chokes, condensers, resistors, coils, etc. Jim Ariana, Box 285, Kicaid, Ill.

INSTRUCTOGRAPHS Wanted: used, A.C. models, complete with tapes. For use in Amateur Radio class. State age, condition and price. G. E. Taylor, VE3EDG, 2835 Isabella St., Ft. William, Ont., Canada

SELL: HQ-100C, $125; NC-98 $75; Heath MR-1, MT-1 and AC power supply, complete station, $300. W4DSY, 198 Jackson, Titusville, Fla.

CRYSTALS Airmailed: Mobile, Net, KWM conversion, SSB, etc. All channels Citizens band, overtone FT-243, $2.95, hermetic, $3.45, Marine frequencies, $2.95. June 1958 QST, "SSB Package" mixer sets, FT-243, $8.95, matched filter sets, $6.90. Novice, all frequencies, 99¢. Airmailing 9¢ per crystal. Crystals? Ask us, we have them all. Crystals since 1933. C-W Crystals, Box 2065, El Monte, Calif.

SELL: 75A1 and Viking II with VFO, mike and antenna relay, $400. Thomas Lindsley, 35 Flannery Ave., Poughkeepsie, N. Y.

WANTED: All types receivers, transmitters, test equipment, teletype equipment in trade for new Hallicrafters, Hammarlund, Johnson Ranger, Valiant, National, Fisher, Hi-Fi 100V, etc. Write or phone: Tom, W1AFN, Alltronics-Howard Co., Box 19, Boston 1, Mass. (Richmond 2-0048).

SX-100 and matching speaker for sale. Like new condition, in original cartons. Closing station. First $200 and arrange pick-up. C. T. Allen, 51 Marion St., Carteret, N. J.

1 KW rig, pair 4-125A final, Globe Chief driver, Johnson VFO, all rack mounted, complete ready to go on air, 3600 volt power supply. Will crate and ship anywhere. First $300 takes it. C. Martinez, 1861 Alston St., Shreveport, La.

TRADE Globe Scout 680A, Harvey-Wells R9A, both in excellent condx, for HQ110 or SX100, etc. State condition, age, serial No. Dr. Bob Baxter, W4YNK, Union City, Tenn.

ELMAC PMR6A with 12v supply, $80; 2 new 832A, $7; Drake 20M half-wave filter, $5.00; new Ronette G-210 microphone, $15; Concertone 29-7 stereo player with 3 Acousticraft cabinets, 2 preamps, 2 amps, 4 spkrs. A-1 condition. Cost $1014 new. Make offer. Want SSB exciter. W2EUE. Albert T. Waters, Jr., 65 Gage Street, Kingston, N. Y.

SELL: Perfect HQ170C in original packing, 3 mos. old, $290; NC-300 spkr, $7.00; Chambers 6-band 813, $85; QST June 1956 KW, 4-400S, $150; Polepig dual primary 12KV CT 3 KVA, $20; uncased polepig 12 KV no CT, $12; General Radio 50B Variac, like new, $50; two large 5-25 hr swinging chokes, $25; 3000V 120 μfd condns., $35. Bud 6 ft. rack, new, $30; Premier 5 ft. rack, $30; UTC VM5 Multi-Match modulator xfrmr, $30. Paul Powell, W5RPF, 500 W. 3rd, Borger, Texas, Phone 3-7598 or 3-7753.

SELL: Globe Champion 300, xmttr, in A-1 condx, best offer over $275 and also NC-300 with xtal cal., 2 & 6 mtr. converters and spkr, A-1 condx for best offer over $275. All above f.o.b. here. W1RHX, John Raposa, 15 Harcourt St., Swansea, Mass.

FOR Sale: SX-101 Mark III n/c, $300; F/W Ranger exc. condx., $200; Hy-Gain 10–15–20 antenna good condx, $40; Matchbox excellent, $35; Transvision CRT Tester rejuvenator, $15; Signal Sentry, new, $15; Johnson or Millen SWR Bridge, $7; two G-E Pyranol Capacitors, 2 μfd 4000V DC, both for $12; old bug, $3. Prices F.o.b. Will pack carefully. K5STO, 2806 Little John Drive, San Antonio 9, Texas.

KWS-1, $1195; L-1000, $345; HQ-170C with timer, $295; SX-101 Mark III, $295; Viking II with VFO, $195; SX-71, $115. Electronic Engineering Co., Wabash, Ind.

FOR Sale: Viking II and VFO, $150; NC-125, $75. Firm, excellent condx. Owner leaving for Europe. Jeffrey McKenzie, 29 Westway, Old Greenwich, Conn.

4D32's, used but guaranteed good. $15 postpaid. W5AXI/4, 10419 65th Ave. North, Largo, Fla.

CALL Letter Signs, 4″ x 12″ with 3 inch letters. Raised letters on cardboard, $1.00. Scotchlite reflected letters on plastic, $2.50. Postpaid. Free list (Barnett, WV6EFI), Redleraft, Box 1244, Studio City 1, Calif.

WANTED: Good clean Collins 75A4 for cash. Give serial, price and particulars. K6TWL, 1014 Hilltop Drive, Chula Vista, Calif.

SX-101, MARK III, hardly used, $325. Guy Black, 930 Fallen Leaf, Redwood City, Calif.

WANTED: Instruction books or other operating instructions for a Mod. 1-177B tube-tester and a Mod. 241 Dumont oscillograph. Contact Ralph A. Porter, State & Fowler St., Batesville, Arkansas.

DX-20,excellent, $50; Heath antenna coupler, $10. K8JLP, Box 281, Waynesburg, Ohio.

SELL Nixonic SWR bridge, $9; Communicator II GM, $125; Boyd GM Preamplifier, $9; 6L6, 80–40 M. transmitter, $15. J. Nixon, 1431 Blackpond Drive, Copley, Ohio.

GONSET Communicator III, 6 meters 6 volts, 12 volts, 110 volts, new, in carton, $250 K3GIM, 227 West Main St., Newark, Delaware. EN 8-6752.

FOR Sale: Globe King 500A with WRL V.F.O. Like new condx A-1. Used about 18 hours. $410.00. Also a 2-meter KW amplifier, completely shielded and with forced air cooling. Rack panel mounting. Amplifier supplied with pair of new, unused 4-125A Eimacs, $75. F. Ciulini, W9MLZ, 6359 So. Keeler Ave., Chicago 29, Ill. PO 7-8938.

HAMMARLUND HQ-160. New, in original carton. W/guarantee card. Received for loan payment. $295. Will ship. A. Alexandian, 2430 25th Ave., San Francisco 16, Calif.

ROTATOR Control cable, heavy duty, 2 No. 16, 6 No. 20 conductors, waterproof rubber jacket, tinned copper armor shield on outside. Sell 400 ft. coil, $20, or 100 ft. multiples 5¢ per ft; 4 unused Eimac 304TL tubes, $10 each; 20 unused Eimac VT-127A tubes, $2.50 each; new condition, 3-speed 2 case portable Magnecord PT6AH tape recorder with PT6J amplifier, original cost, $800. Sell for $375 or trade for HT32A in gud condx. Electro-Voice Mod. 60, 50 ohm dynamic microphone w/cable, perf., $18. All above express only. R. Watterlohn, W9SHE, 8836 Central Ave., Morton Grove, Ill.

GUNS and shooting accessories wanted. Have mobile and test equipment to trade. W2LJU.

HRO-5TA1. Outperforms some present day $400 receivers in ability to pull weak signals. Will sell to highest cash offer. W4YOC, Tarpon Springs, Fla.

NATIONAL NC-60 in immaculate condition. Any Chicagoan can have it for $45.00. KN9REX, 8212 South Albany.

FOR Sale: NC-300 with matching spkr, 200 Kc xtal, calibrator, excellent condx. $245.00. Win Brown, K6EVB, 7737 Fair Ave., Sun Valley, Calif. Tel. PO 4-8475.

WANTED: NC-57 or S-40 A receiver with owner's manual. State condition and lowest cash price. Prefer New England area deal. Jos. Mocker, Jr., 47 Prospect, Taunton, Mass.

KW1 and spare tubes, cash on the line. Take it away for $2050. HT32A, brand new, never used: $595. H. Langerman, W2LBJ.

HAMMARLUND HQ-150 receiver and speaker, Duomatic keyer AKS-7, Hy-Gain AV 14 vertical and 2 other antennas, 52-75 ohm low-pass, Moore S.W.R. bridge and meter, P&W balun unit, xtals, relays, BC-455 AC monitor, send for list. W6QBO, 828 Nevada, San Jose 25, Calif.

Index of Advertisers

9 NEW RIDER BOOKS

BASICS OF MISSILE GUIDANCE & SPACE TECHNIQUES *By Marvin Hobbs*

Electronics is playing a vital role in the race to achieve mastery of outer space and send manned missiles rocketing to the moon and beyond. You can learn and easily understand the fundamentals of the important electronic areas that will contribute to the conquest of space with this 2 volume picture book course. It is divided into two broad parts. Volume 1 covers the elements of control and guidance. Extensive coverage is given to radio and radar command links, guide beam, doppler and homing methods, fundamentals of gyroscopics, inertial and celestial navigation, computer applications, and actuators as well as their related components. In the second volume, devoted to radio telemetry and space techniques, testing and telemetering, space exploration by optics and electronics are covered. There is a fascinating coverage of satellite theory and practice, satellite monitoring and tracking, and applications of earth satellites. Navigation in space along with components and power sources for space applications are discussed. #229, 2 vols., soft covers, **$7.80 per set**; #229-H, 2 volumes in single cloth bound edition, **$9.00.**

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W2RID There's a world of electronic know-how in these easy to understand low cost RIDER books. At your jobber or book store, or order direct. **Dept. Q-7**

BUILDING THE AMATEUR RADIO STATION *by Julius Berens, W2PIK.* If you intend to buy the equipment for an amateur radio station, or build one, you will find this volume indispensable. This book is the next step for the beginner amateur radio enthusiast who has earned his operating license. A guide for construction of the beginner's transmitter and receiver. Also includes instructions for receiver and transmitter on-the-air operation. #221, $2.95.

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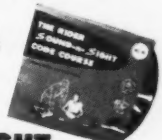

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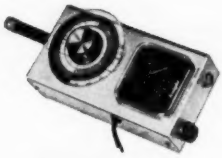

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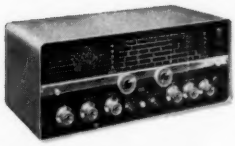

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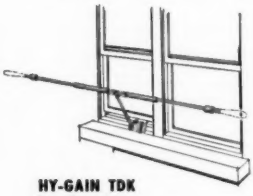

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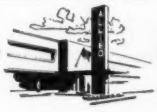

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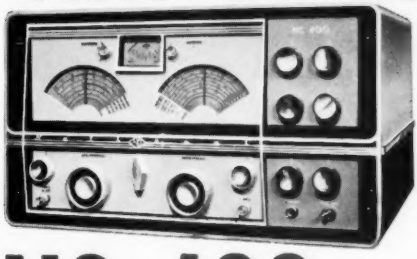

NC-400

The Most Versatile Communications Receiver Ever Designed

The NC-400 is a modern, multiple purpose, general coverage receiver. Tuning range is 540 kc to 31 mc in 7 bands, with dual conversion on all frequencies above 7 mc. Its unique design provides maximum flexibility of operation to satisfy a wide variety of communications requirements.

The NC-400 may be used as a self-contained unit, either manually tuned or crystal controlled on pre-selected frequencies. In addition, external master oscillator provisions make possible use of modern synthesizer techniques for applications where extreme frequency stability is required. It may be operated in space or frequency diversity applications. Provisions are made for interconnection of any required outputs or for feed to external loads or combiners. All frequency determining circuits may be internally or externally controlled. The NC-400 also provides optimum versatility of bandwidth, either through the use of internal IF circuits or the use of optional mechanical filters.

FREQUENCY RANGE:	GENERAL COVERAGE
Band 1	.54– 1.1 MC
Band 2	1.1 – 2.1 MC
Band 3	2.1 – 4.1 MC
Band 4	4.1 – 7.0 MC
Band 5	6.9 –12.2 MC
Band 6	11.8 –20.4 MC
Band 7	19.6 –31.0 MC

NOTE: Bandspread dial provided with 0-100 logging scale and calibrated for 80, 40, 20, 15 and 10 meter amateur bands.

FREQUENCY STABILITY: Long term stability after warm-up –.002%

SENSITIVITY: 1 microvolt for 10 db signal/noise ratio

SELECTIVITY: 4, 8 and 16 kc positions provided with 6 tuned circuits. 3.5 kc wide upper and lower sideband positions provided with 14 tuned circuits. 3.5 kc sharp position activates plug-in crystal filter providing 5 additional degrees of selectivity below 3 kc plus phasing notch. Plug-in accessory available which will provide front panel selection of three mechanical filters without modification of receiver. Proper choice of filters will enable selection of bandwidths from 500 cycles to 16 kc, or will enable filter type of sideband selection from front panel.

SSB PROVISIONS: Separate SSB heterodyne detector uses pentagrid converter and separate beat oscillator. Beat oscillator may be crystal controlled. Special "fast-attack-slow release" AGC circuit. Sideband selection accomplished by exclusive, new National passband switching techniques. In the event of commercial-type SSB reception, single sideband mechanical filters may be installed and switched from front panel.

FIXED CHANNEL OPERATION: HF oscillator has 5 crystal sockets for use in fixed channel operation. Channels may be selected by front panel switch. In addition, HF oscillator may be controlled from external master oscillator selected by front panel switch. "S" meter "Tune" position permits rapid tuning of receiver to crystal controlled channel.

DIVERSITY PROVISIONS: Basic receiver may be operated from master oscillator as noted above. An accessory Diversity Modification Kit (NC-400 DMK) allows choice of internal or external control of all oscillators. Rear panel selector provisions make possible use of any receiver either as master control, or slave fed from other oscillator sources. IF, detector and AGC outputs available for feed to external loads or combiners.

POWER REQUIREMENTS: 110-220 volts, 50-60 cycles AC

MANUFACTURER'S SUGGESTED LIST PRICE: $895.

OPTIONAL ACCESSORIES:

1. XCU-400 crystal calibrator. Output frequencies of 100 kc. and 1 mc.
2. NTS-2 matching speaker
3. NC-400 DMK diversity modification kit
4. NC-400 FH mechanical filter housing

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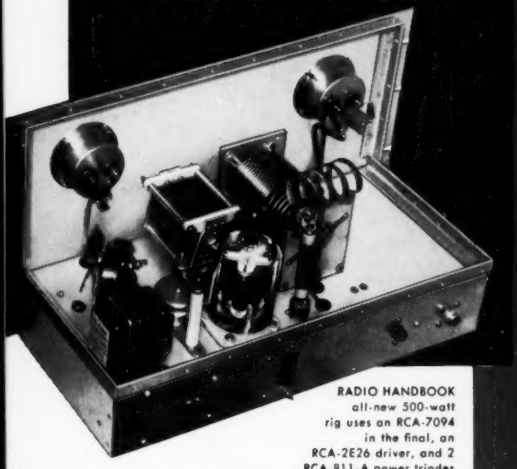
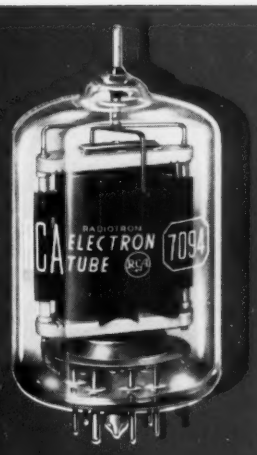
features RCA-7094 in its "DeLuxe" 500-Watt Transmitter



RADIO HANDBOOK all-new 500-watt rig uses an RCA-7094 in the final, an RCA-2E26 driver, and 2 RCA-811-A power triodes in the modulator.



RCA-7094

Has What It Takes for Beam Power QRO

- Gold-plated control grid minimizes grid emission
- Triple base-pin connections for screen grid to permit effective rf grounding
- Internal multiple plate leads (copper brazed) for improved thermal conductivity and reduced plate-lead inductance
- High-alumina ceramic spacers strengthen electrode structure, reduce rf losses, increase tube life
- Larger integral radiating fins on plate for effective cooling
- Large cathode area and low cathode-current density provide high perveance and long tube life
- Rugged button stem with tungsten leads for reduced rf losses
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Again, it's RADIO HANDBOOK time—and this time the big transmitter news is the deluxe 500-watt band-switching rig covering the bands from 10 to 80. For this "transmitter of the year", the RADIO HANDBOOK editors selected an RCA-7094 beam power final—and here's what the RADIO HANDBOOK says:

"This compact tube has high perveance and high power gain. It can be operated at full input to 60 Mc., and has a maximum plate dissipation of 125 watts. In addition, it has triple base-pin connections for the screen grid to permit good r-f grounding and large plate radiating fins for effective cooling. The compact size makes it especially effective in the high-frequency portions of the communications spectrum. Driving requirements are modest and permit the use of a simplified bandswitching exciter."

RCA-7094 high-perveance beam power tubes are available through all RCA Industrial Tube Distributors. Drop a card for technical bulletin on this type to RCA Commercial Engineering, Section G-37-M, Harrison, N. J.

Typical Operating Values for Amateurs

TYPE OF SERVICE	CW	AM	SSB AB₁
DC Plate Volts	1500	1200	2000
DC Grid-No. 2 Volts	400	400	400
DC Grid-No. 1 Volts	−100	−130	−65
DC Plate Ma.	330	275	200*
DC Grid-No. 2 Ma. (approx.)	20	20	35*
Required Driver Power Output Watts (approx.)**	4	5	4*
Useful Output Watts (approx.)††	340	240	250*

*Maximum-Signal Value **At 60 Mc.
††70% Output-Circuit Efficiency

RCA **RADIO CORPORATION OF AMERICA**
Electron Tube Division Harrison, N. J.

For the name of your nearest RCA Industrial Tube Distributor, call Western Union by 'phone number and ask for Operator 25.